Forecasting Research Division

An atlas of fetch-limited wave height over the North Sea. Part 2: The Atlas

This document accompanies:

Forecasting Research Division
Technical Report No. 46

by

M.W. Holt

May 1993

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London Road, Bracknell RG12 2SZ

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An atlas of fetch limited wave heights over the North Sea

The attached charts are an atlas of fetch limited wave height over the North Sea, calculated using the UKMO wave model at the resolution of the European waters grid, which is 0.4 degrees longitude by 0.25 degrees latitude. The wave model used 16 direction components, giving a directional resolution of 22.5 degrees. Shallow water effects were not included.

The charts are for a (19.5m) windspeed of 15m/s, for a duration of 60 hours. Charts are shown of wave height over the full model area with a contour interval of 0.5m, at 10 degree intervals of wind direction. The direction in the title is 'wind direction FROM' in degrees. The fully developed wave height is 4.77m.

Difference charts of wave height between adjacent wind directions are also presented for the North Sea and UK coastal waters. Here the contour interval is 0.1m and positive differences are shaded at intervals of 0-0.2m, 0.2-0.4m and >0.4m .

The first figure shows the wave model gridpoint types for the UK area. Model coast points are shown by a '2'. Coast points are used as a sink for onshore wave energy, and have zero wave energy in offshore directions. No wave growth is applied at a coast point.

Several interesting features are discussed in the accompanying Technical Report No 46, which further describes the contents of the atlas.

GRIDPOINT TYPES extended EUROPEAN grid

1 = sea 2 = coast

VALID AT 18Z ON 3/3/1993 DATA TIME 18Z ON 3/3/1993

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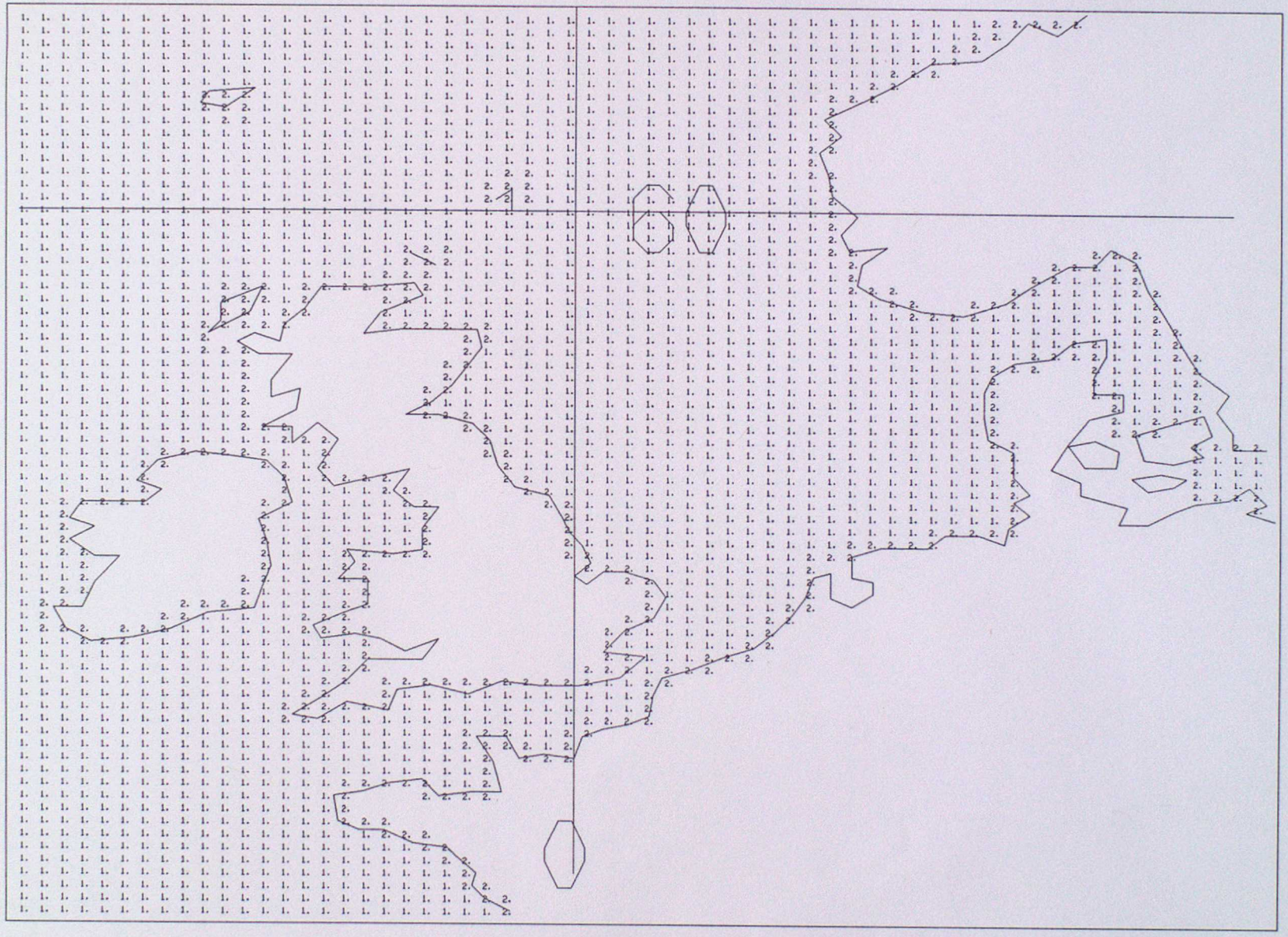

EUROPEAN GRID DEEP FETCH 15M/S 270 DEG
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
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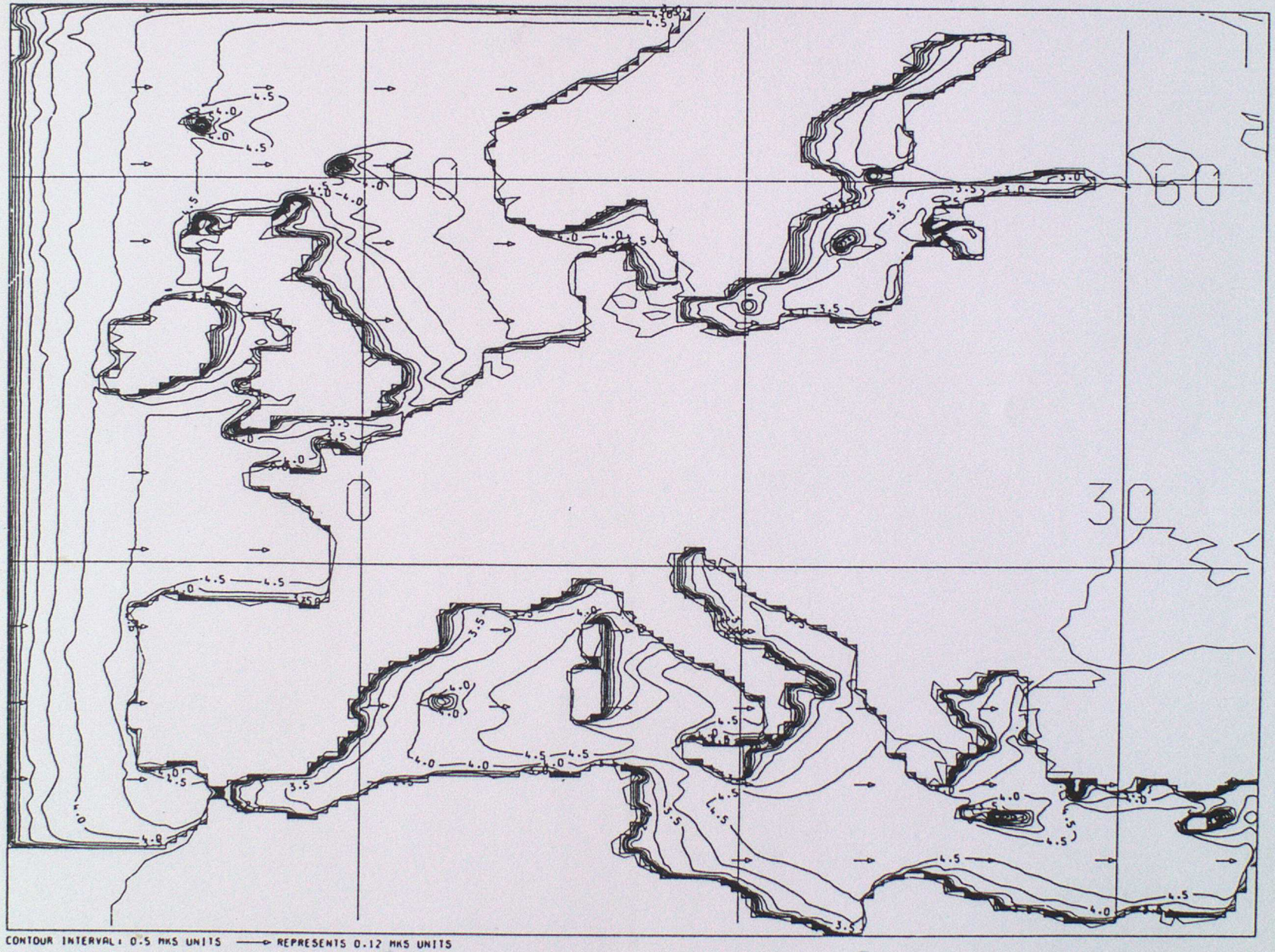

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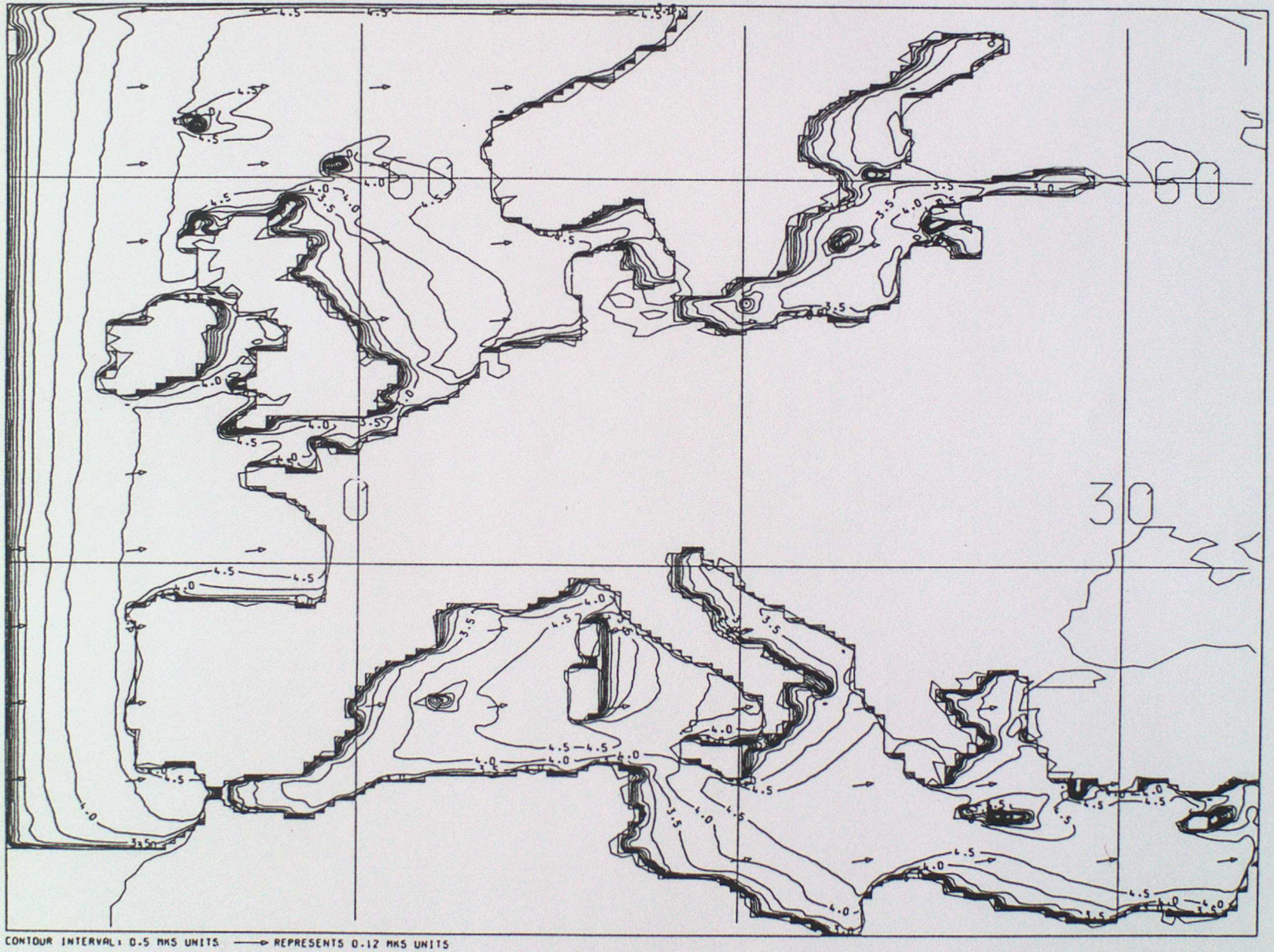

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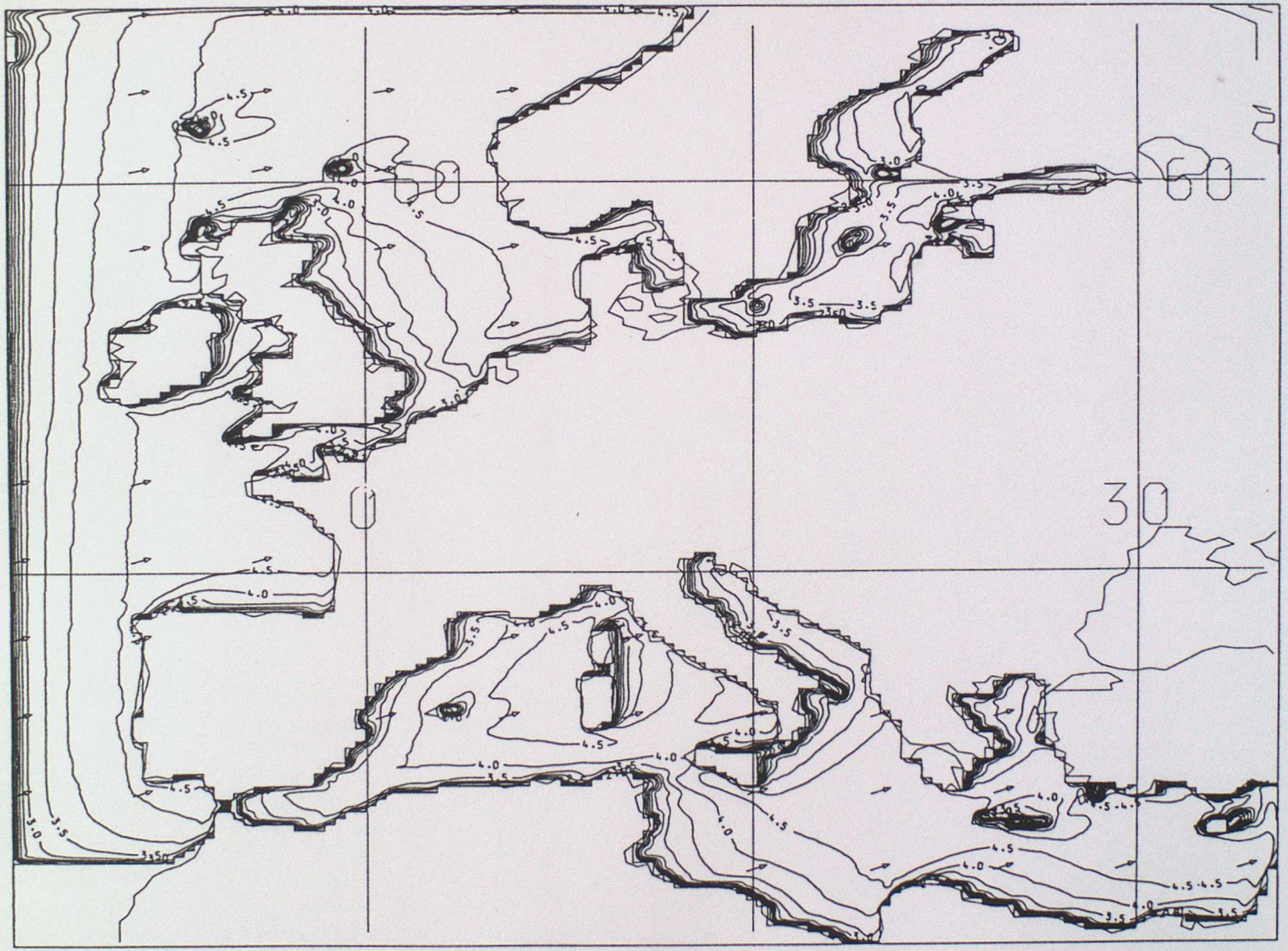

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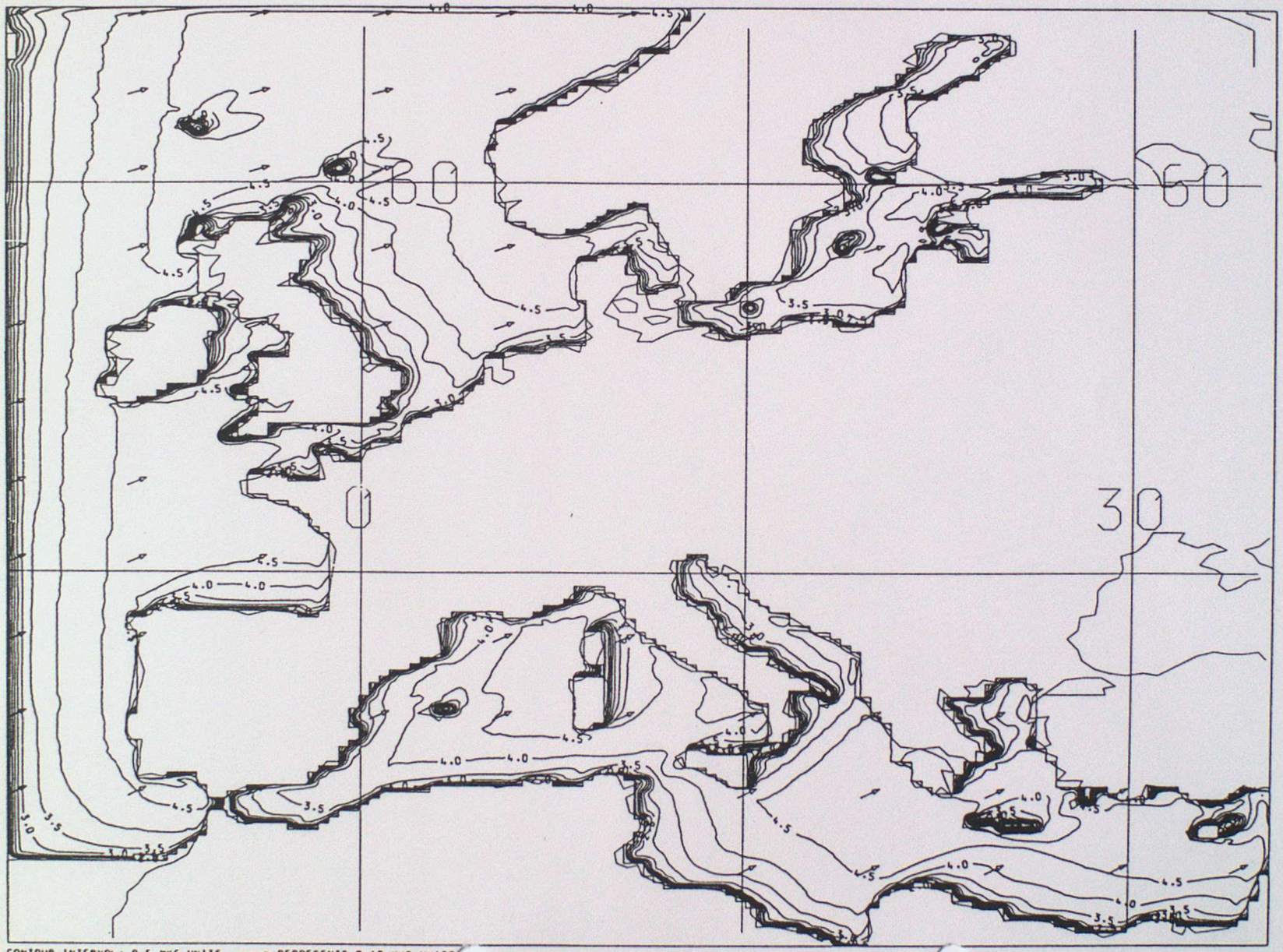

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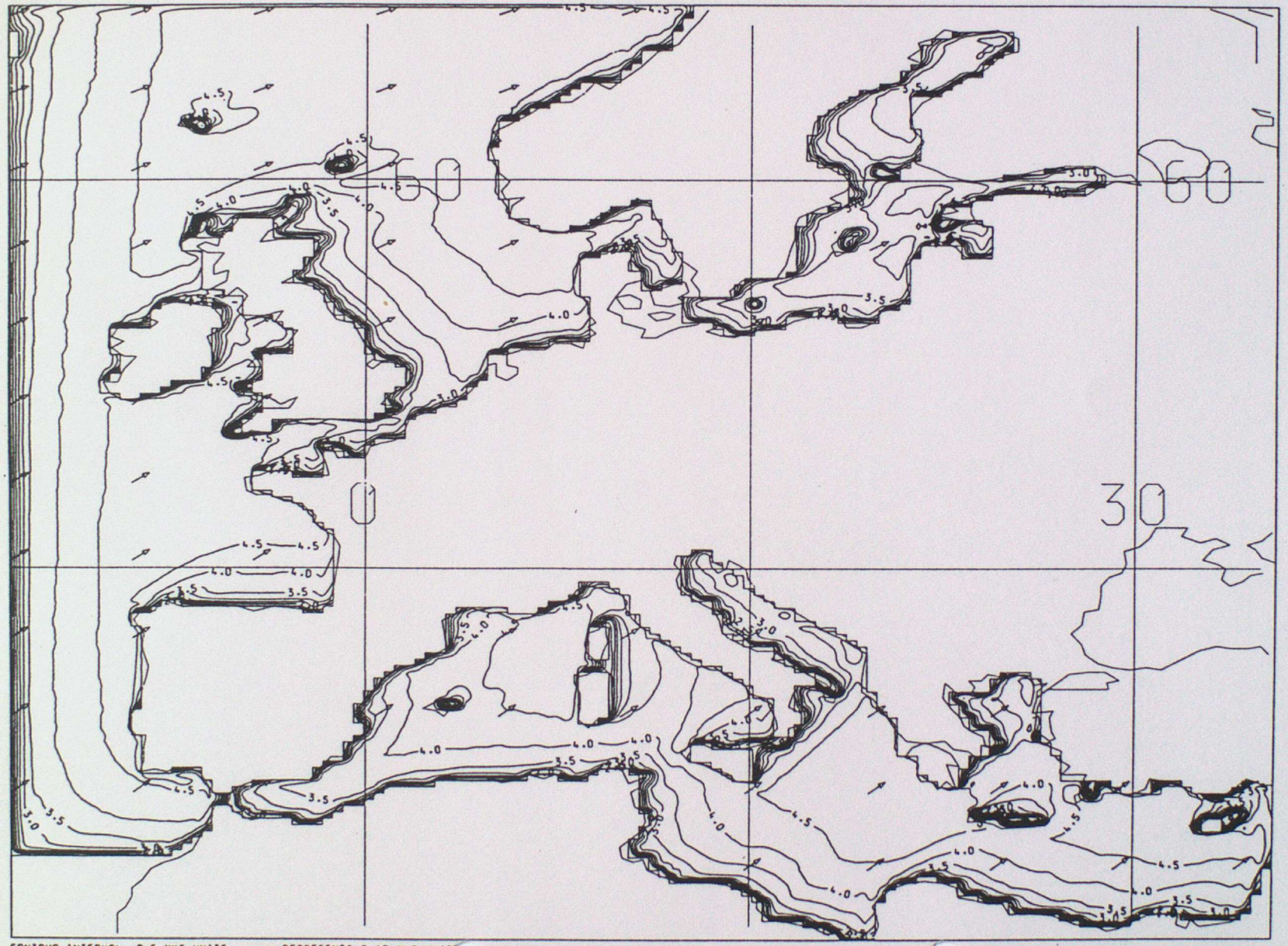

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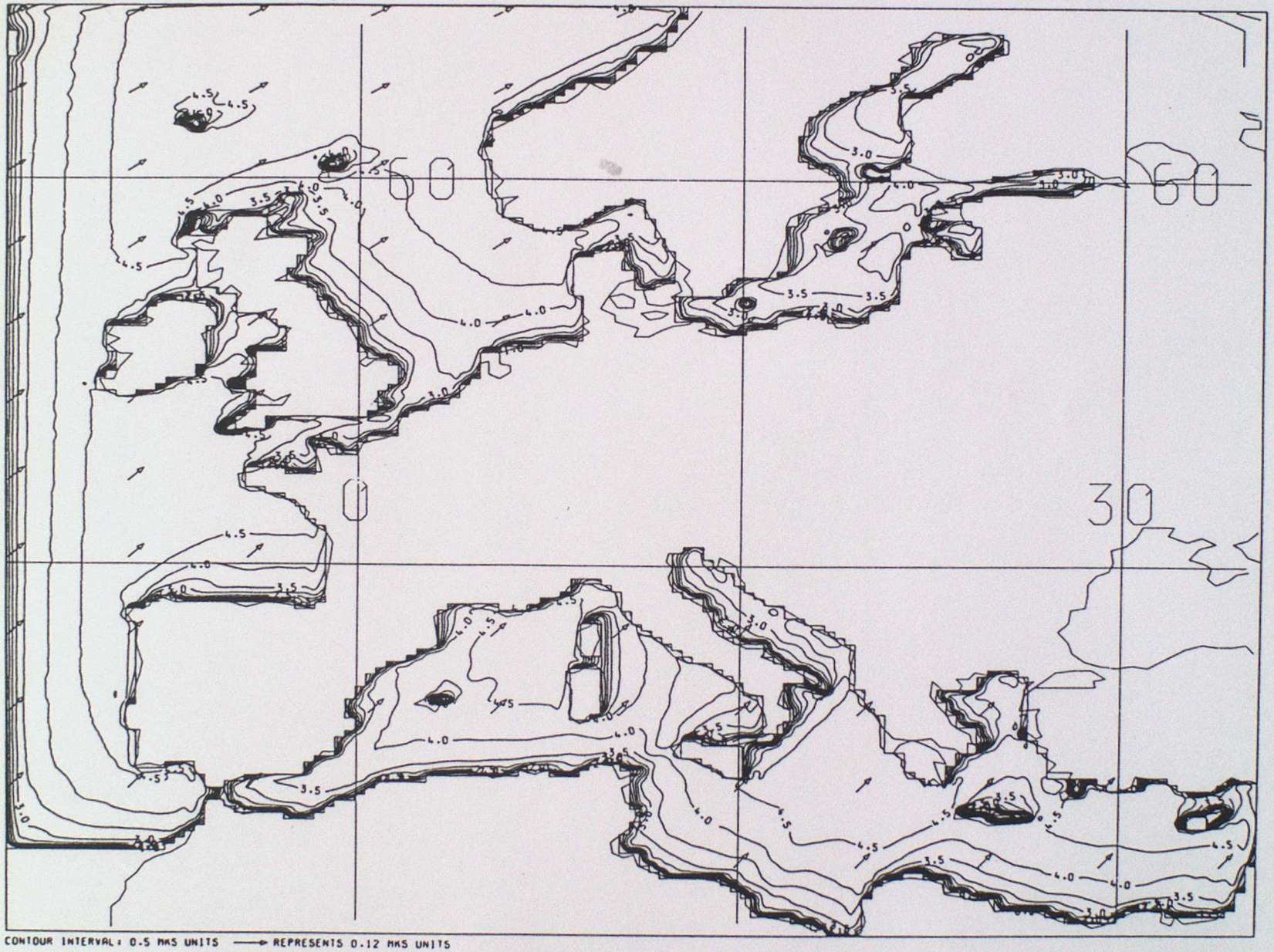

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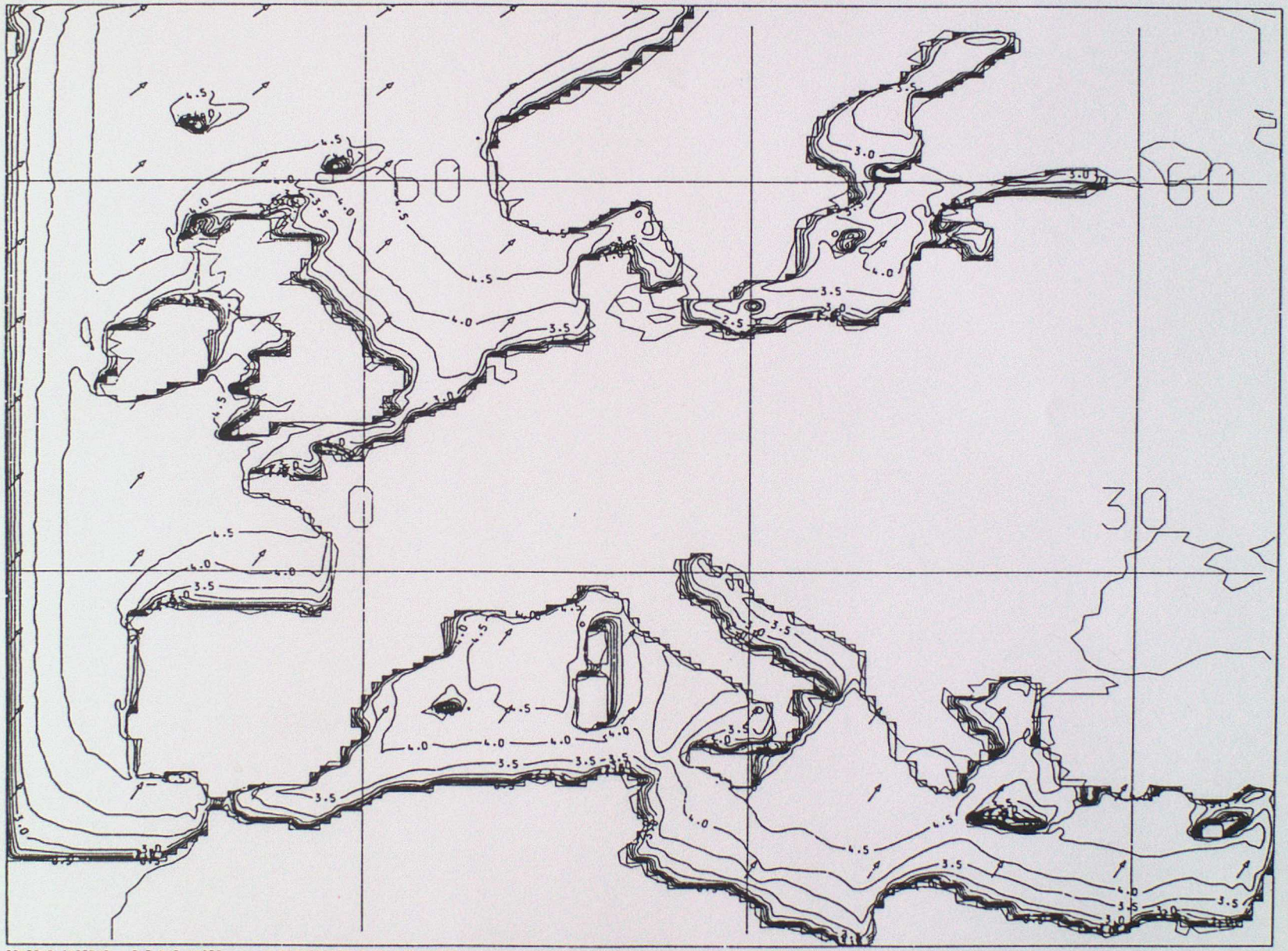

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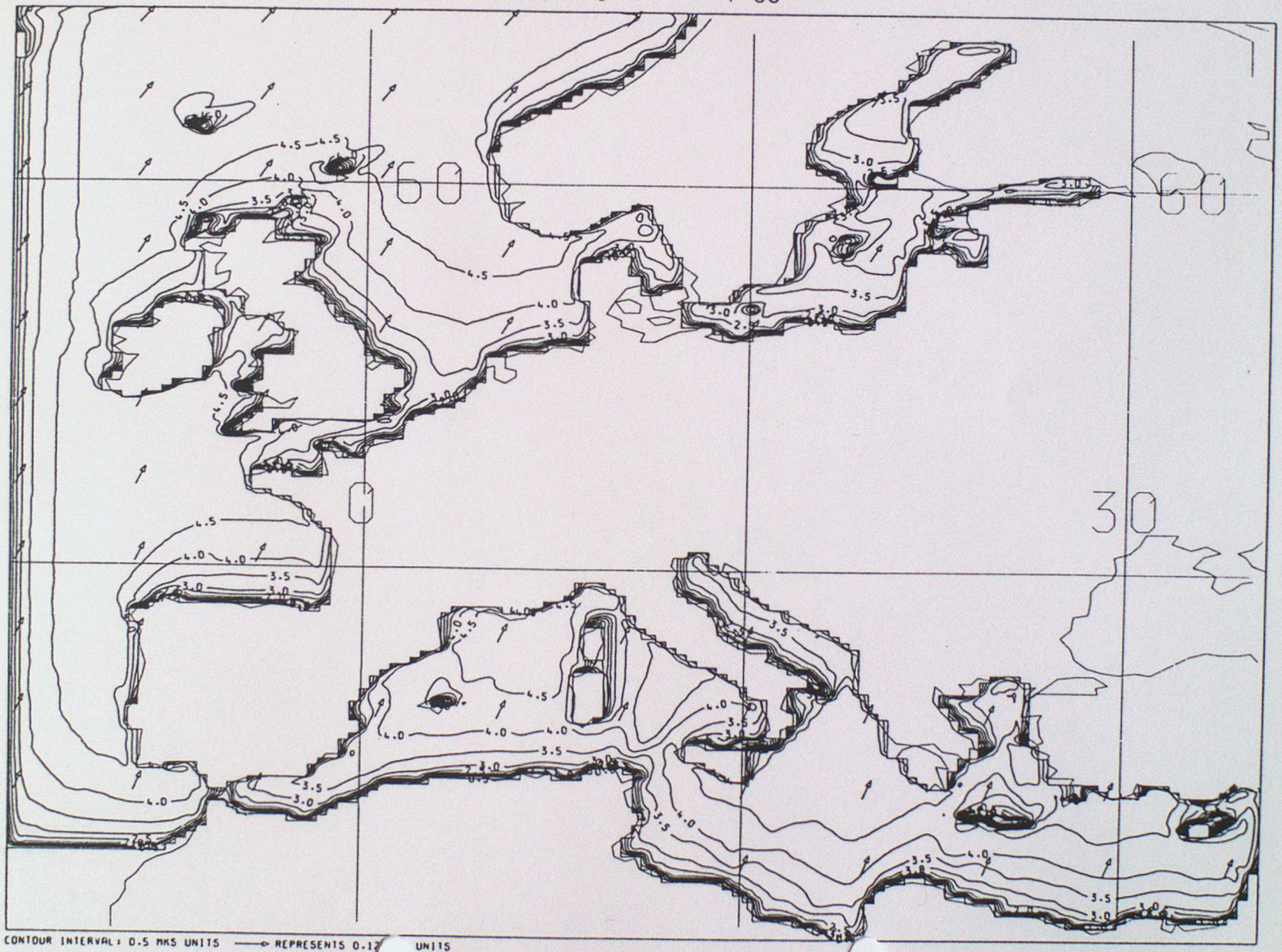

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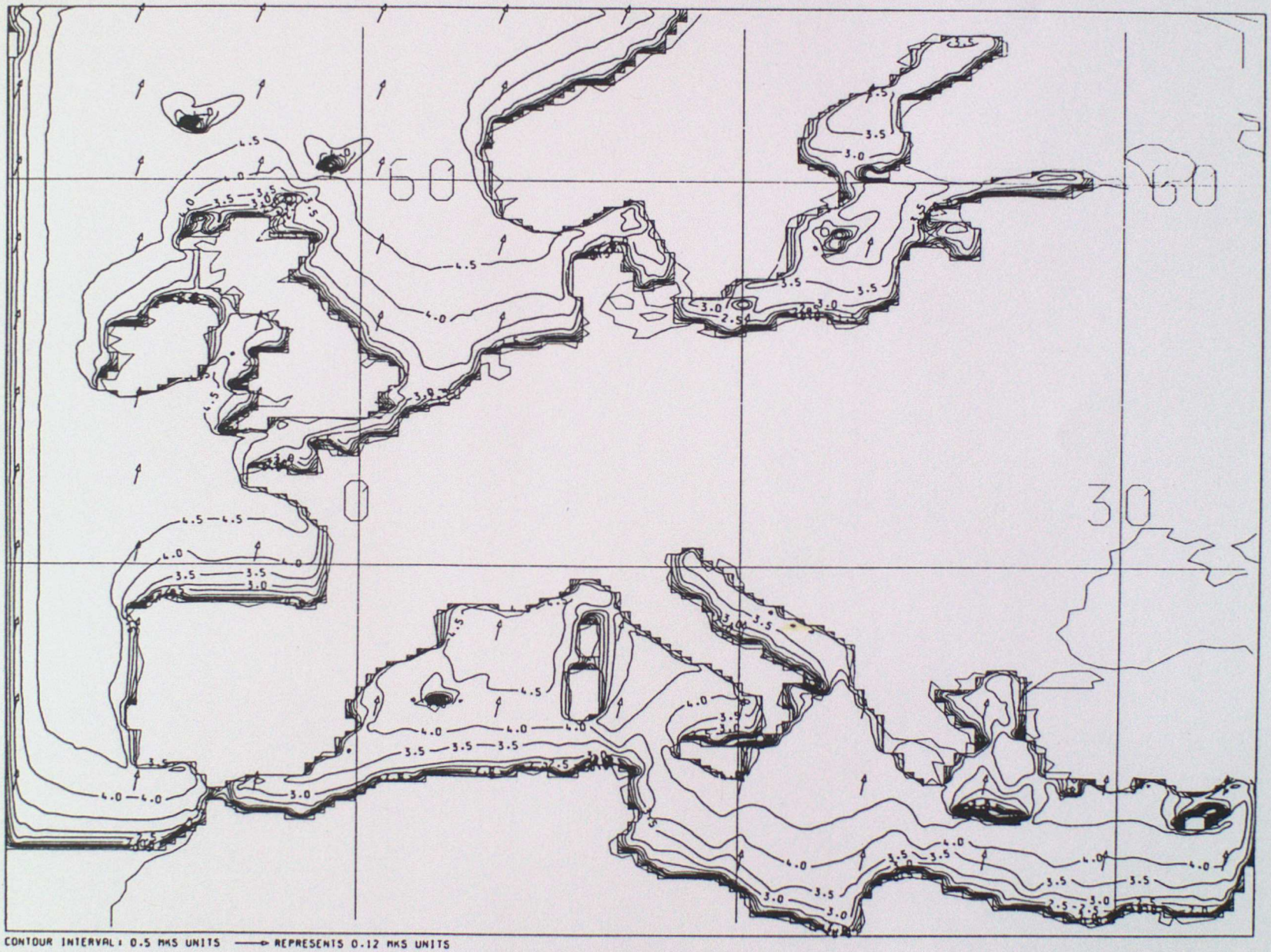

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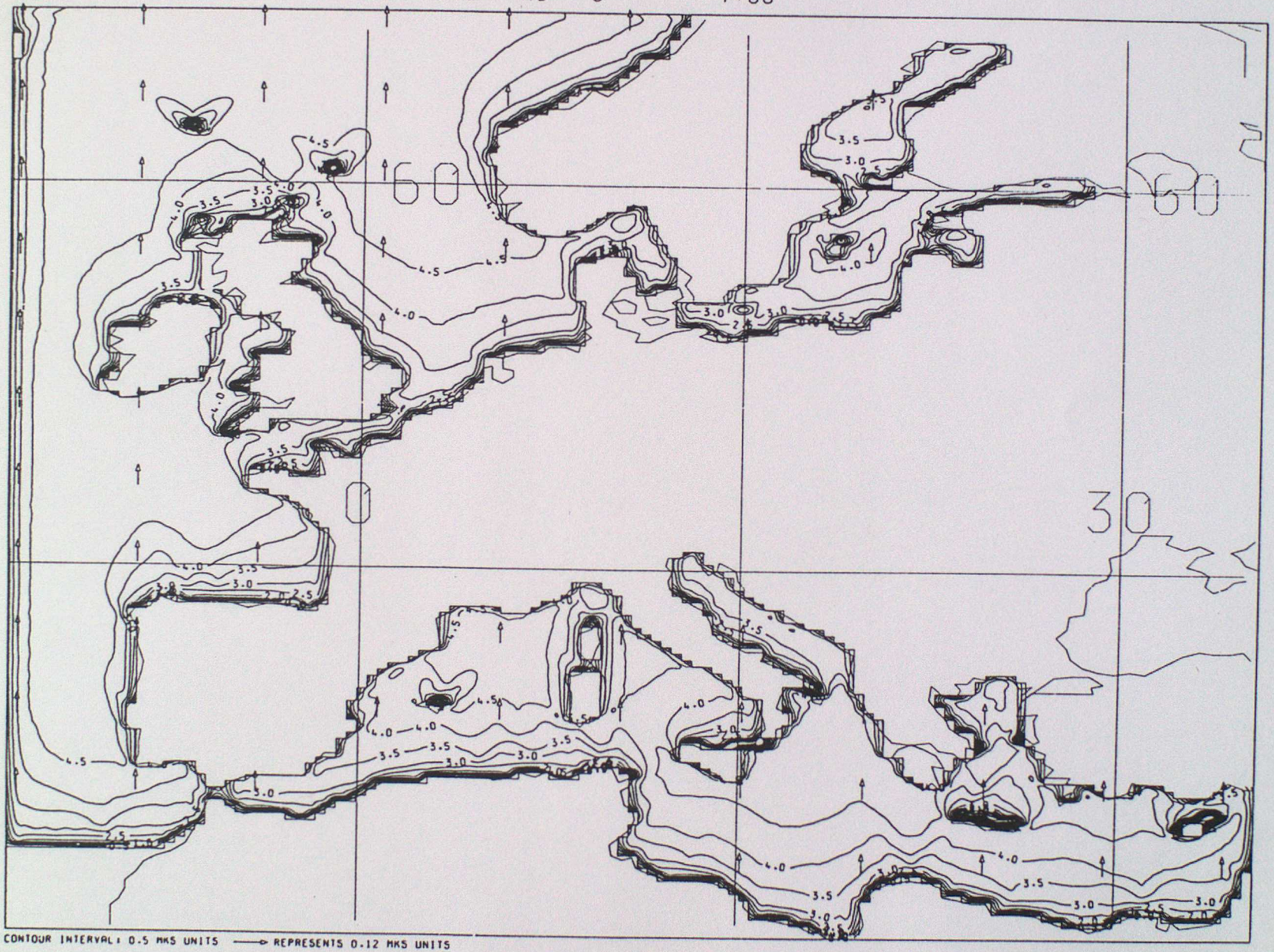

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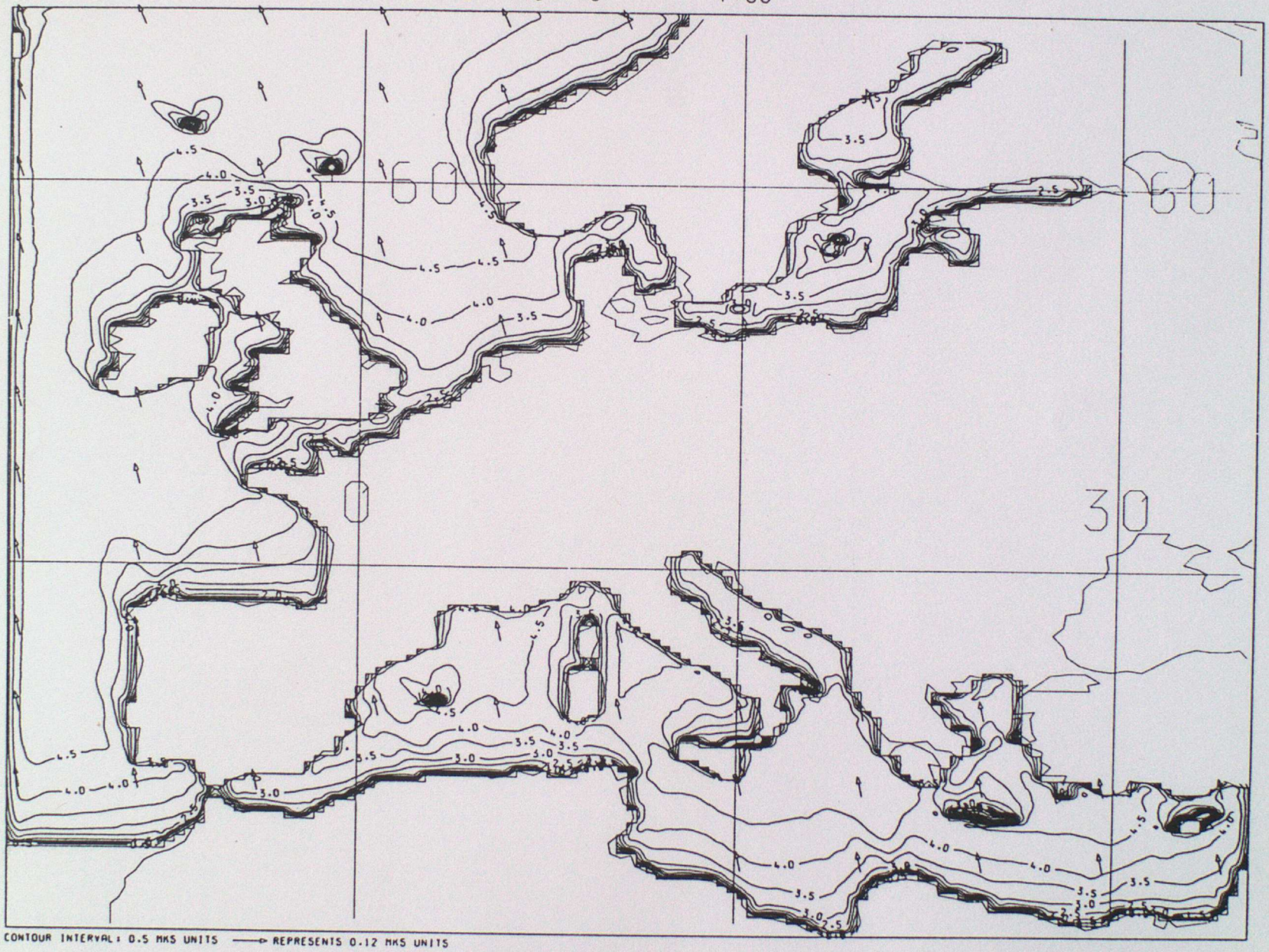

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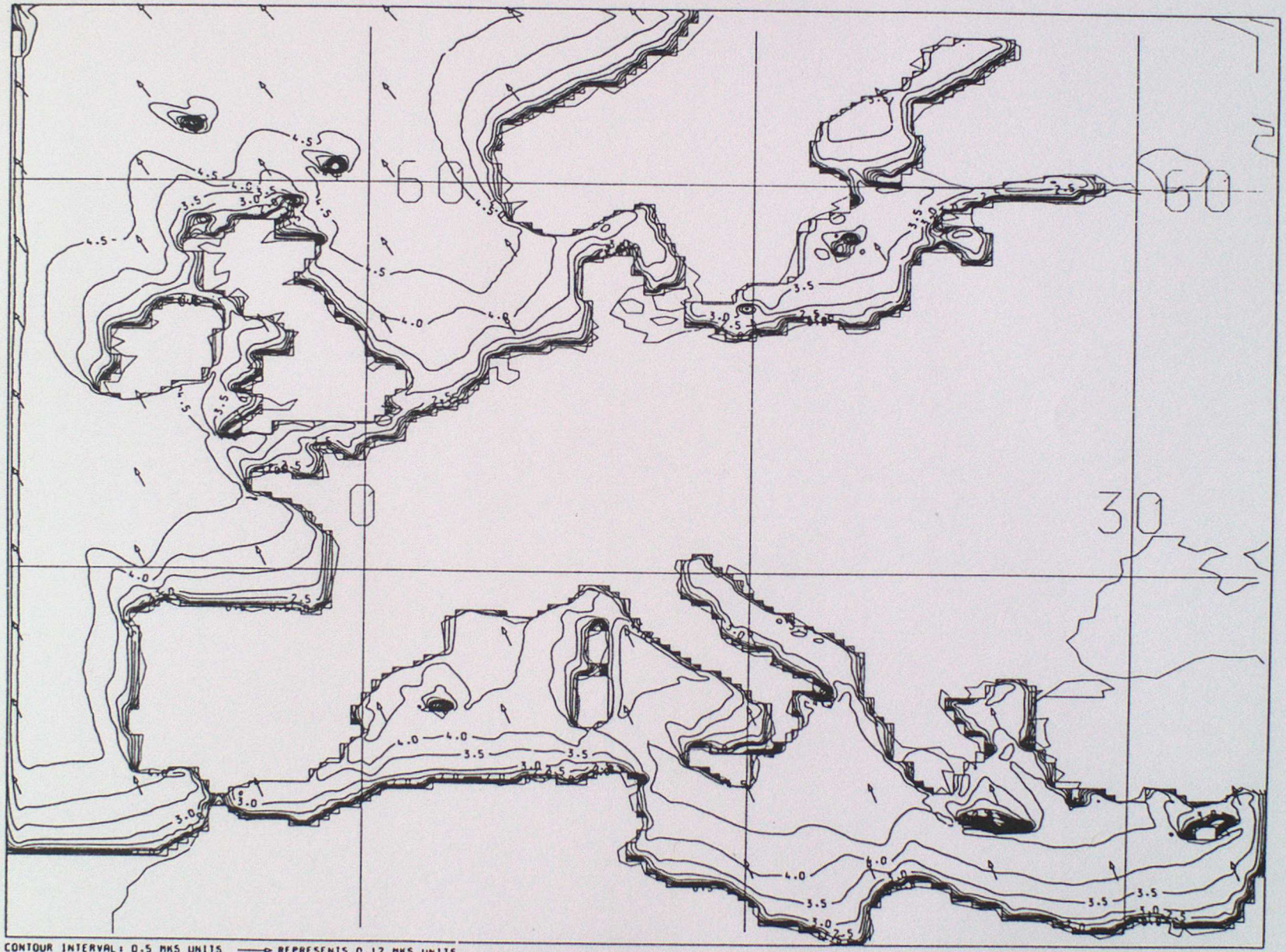

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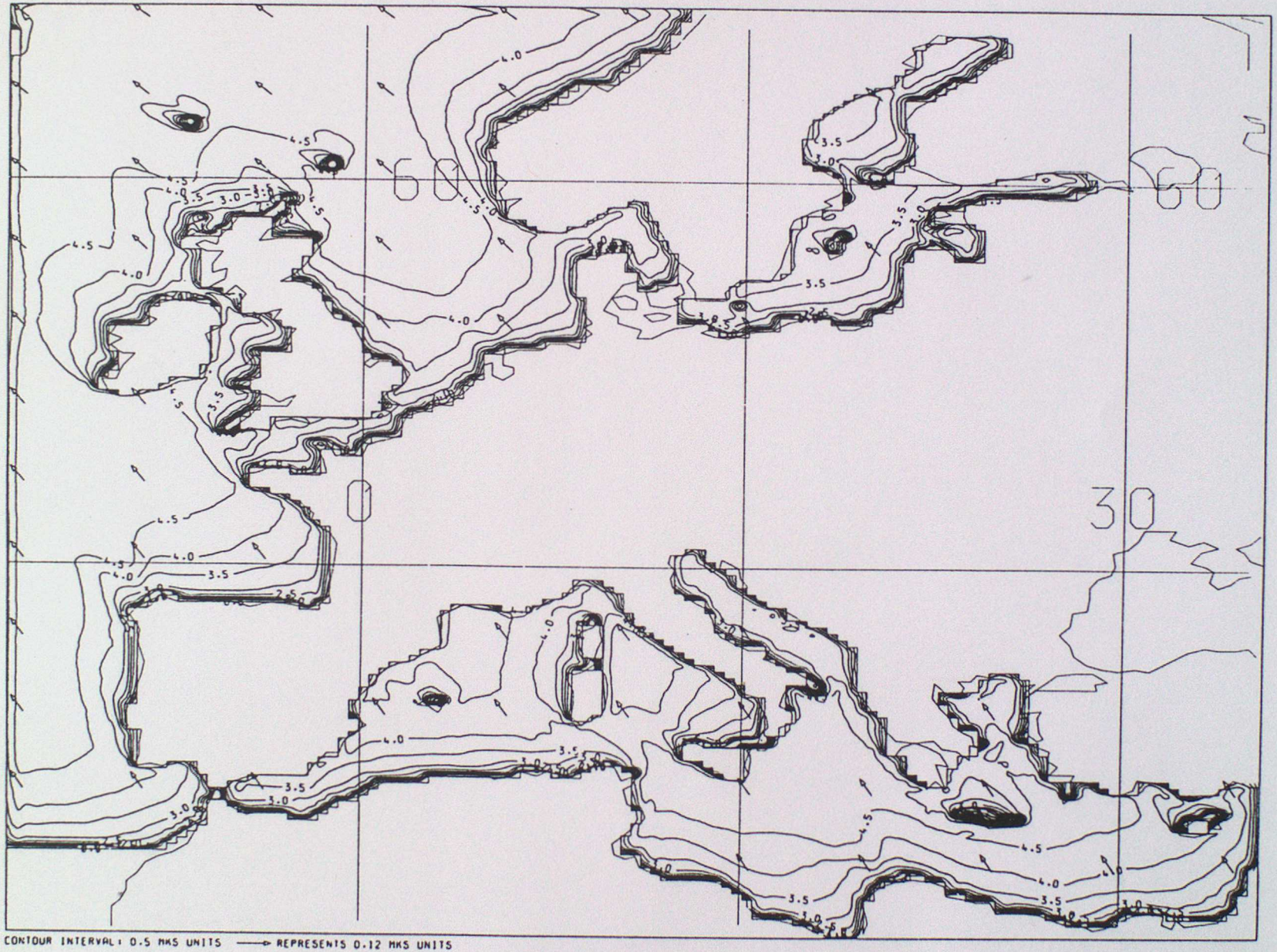

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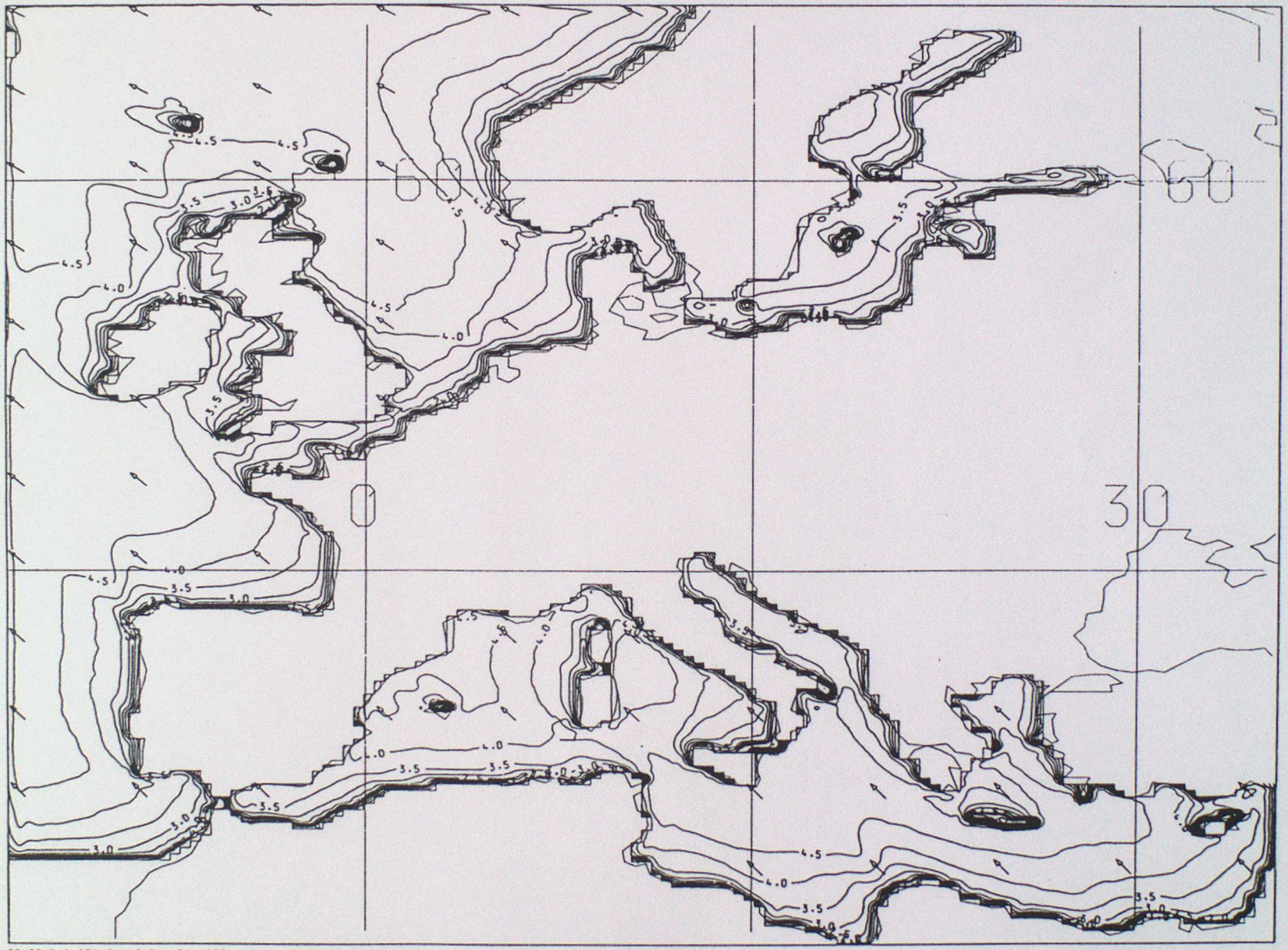

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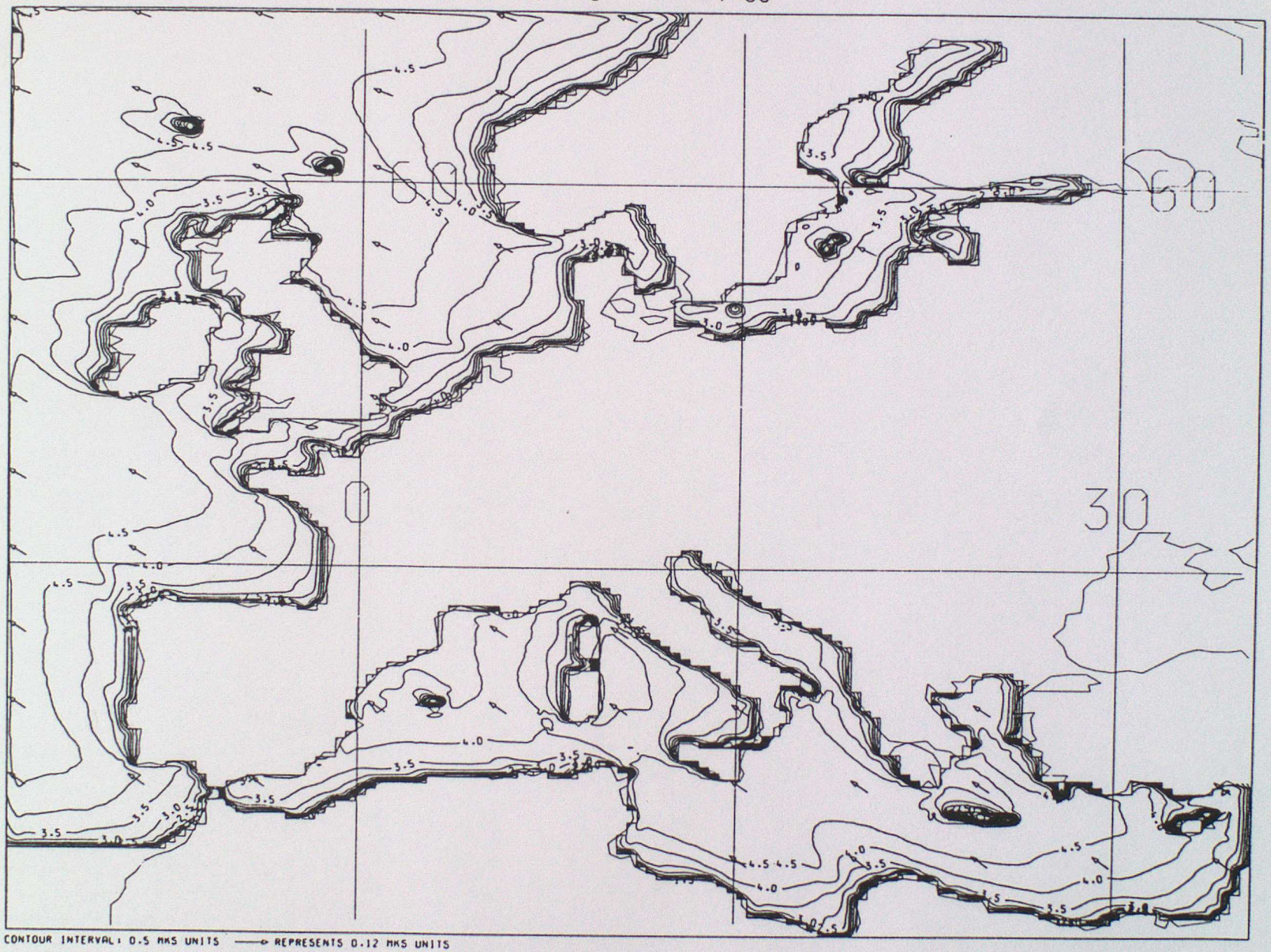

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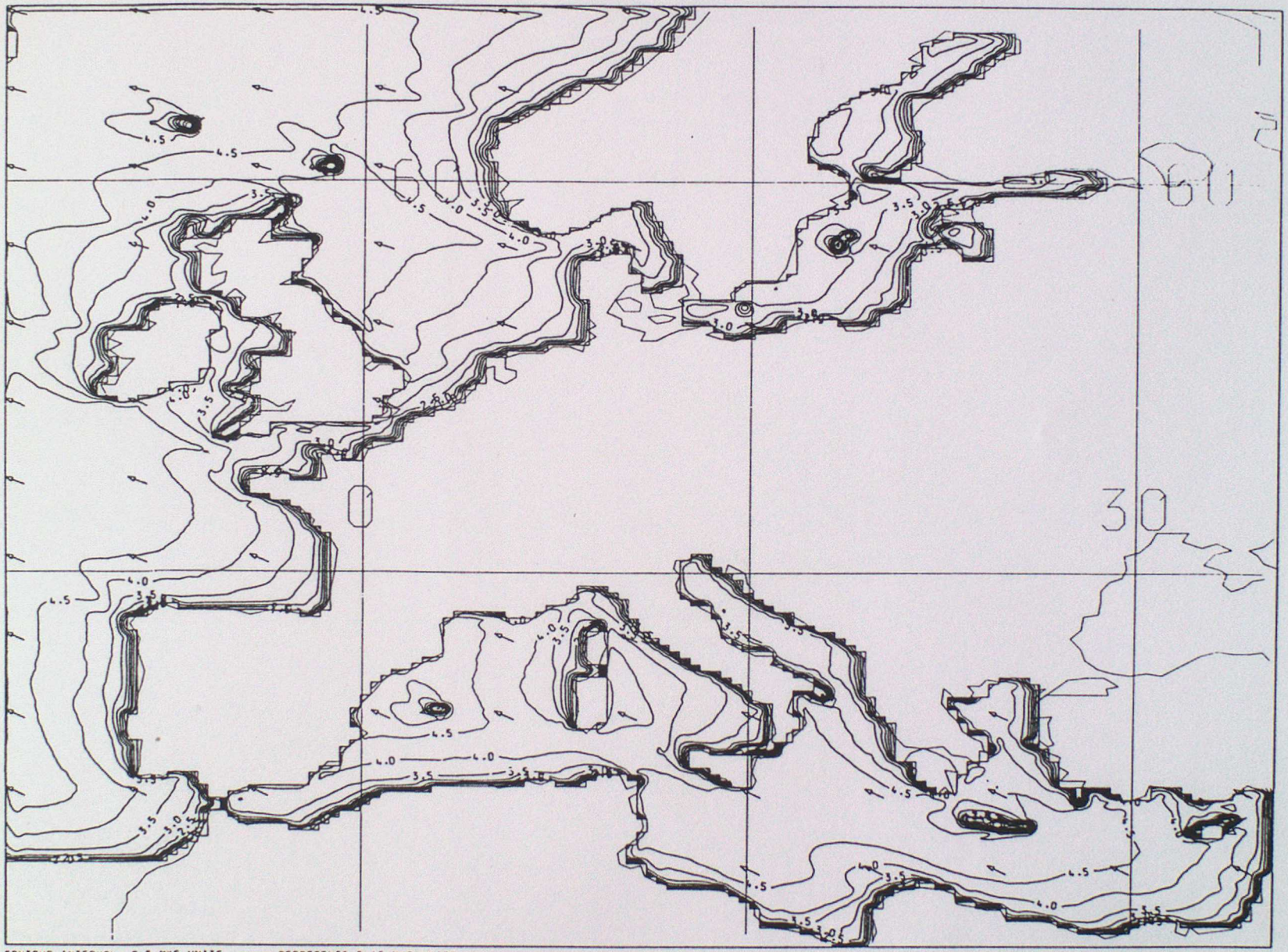

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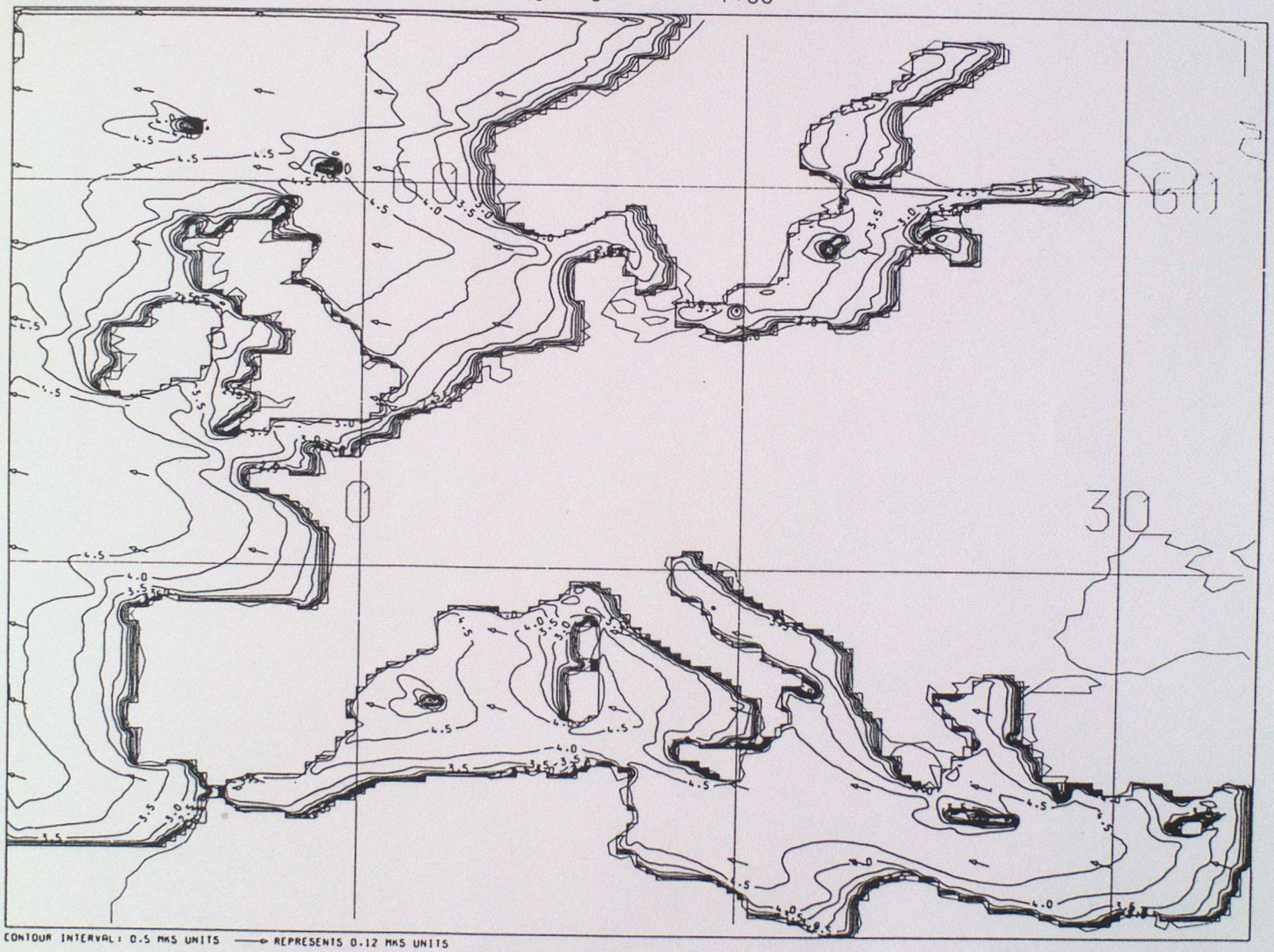

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SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
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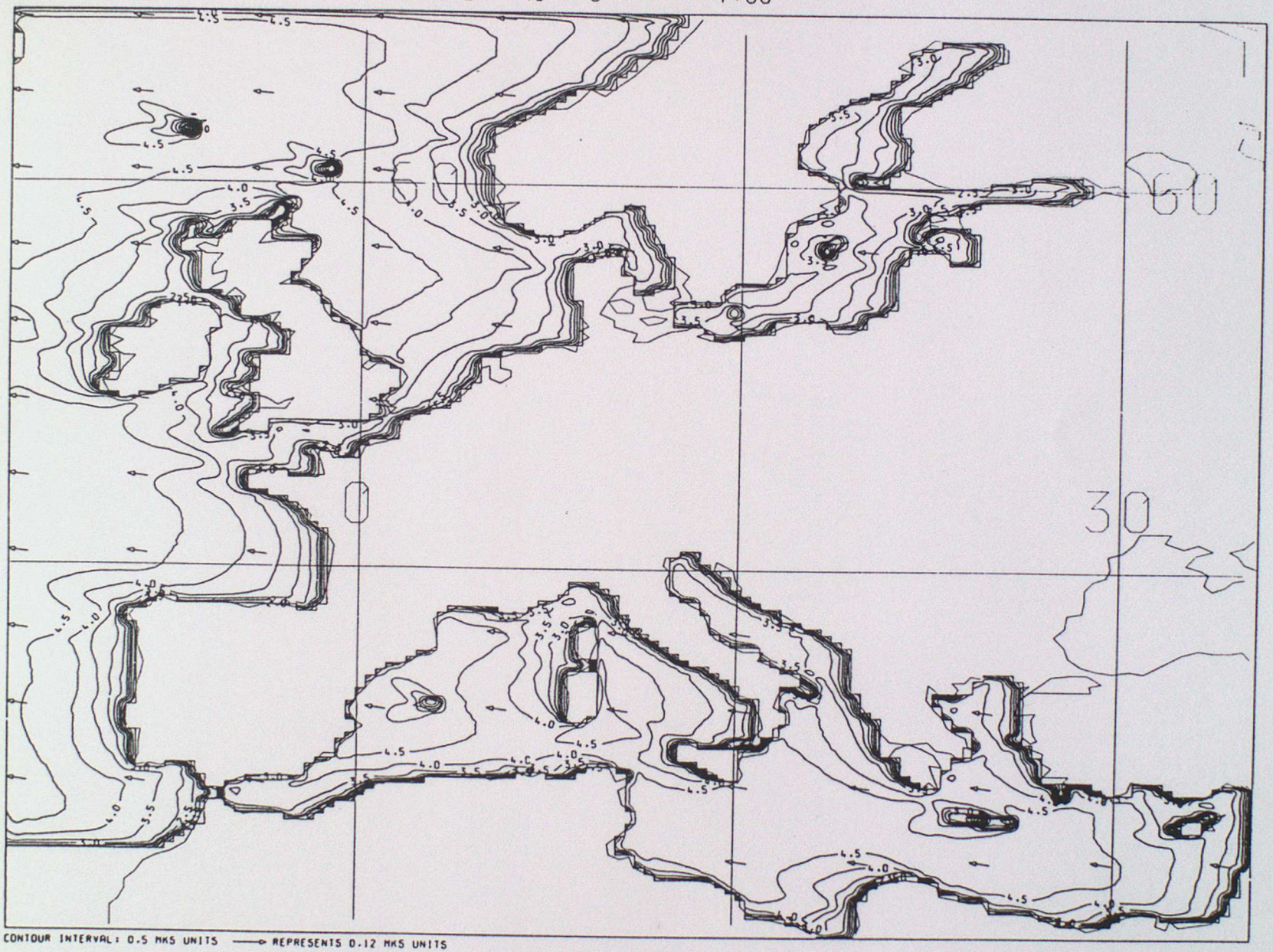

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SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
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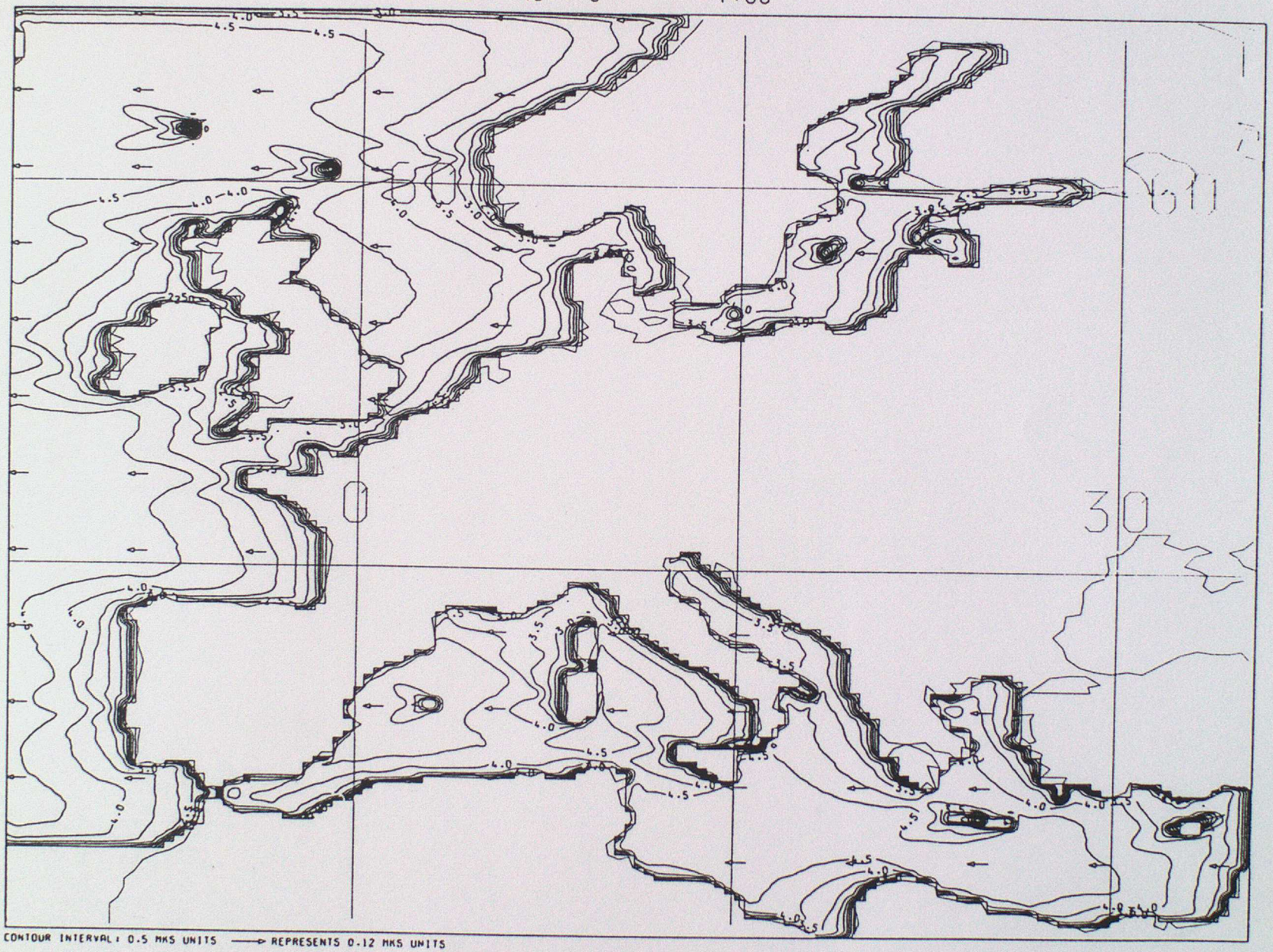

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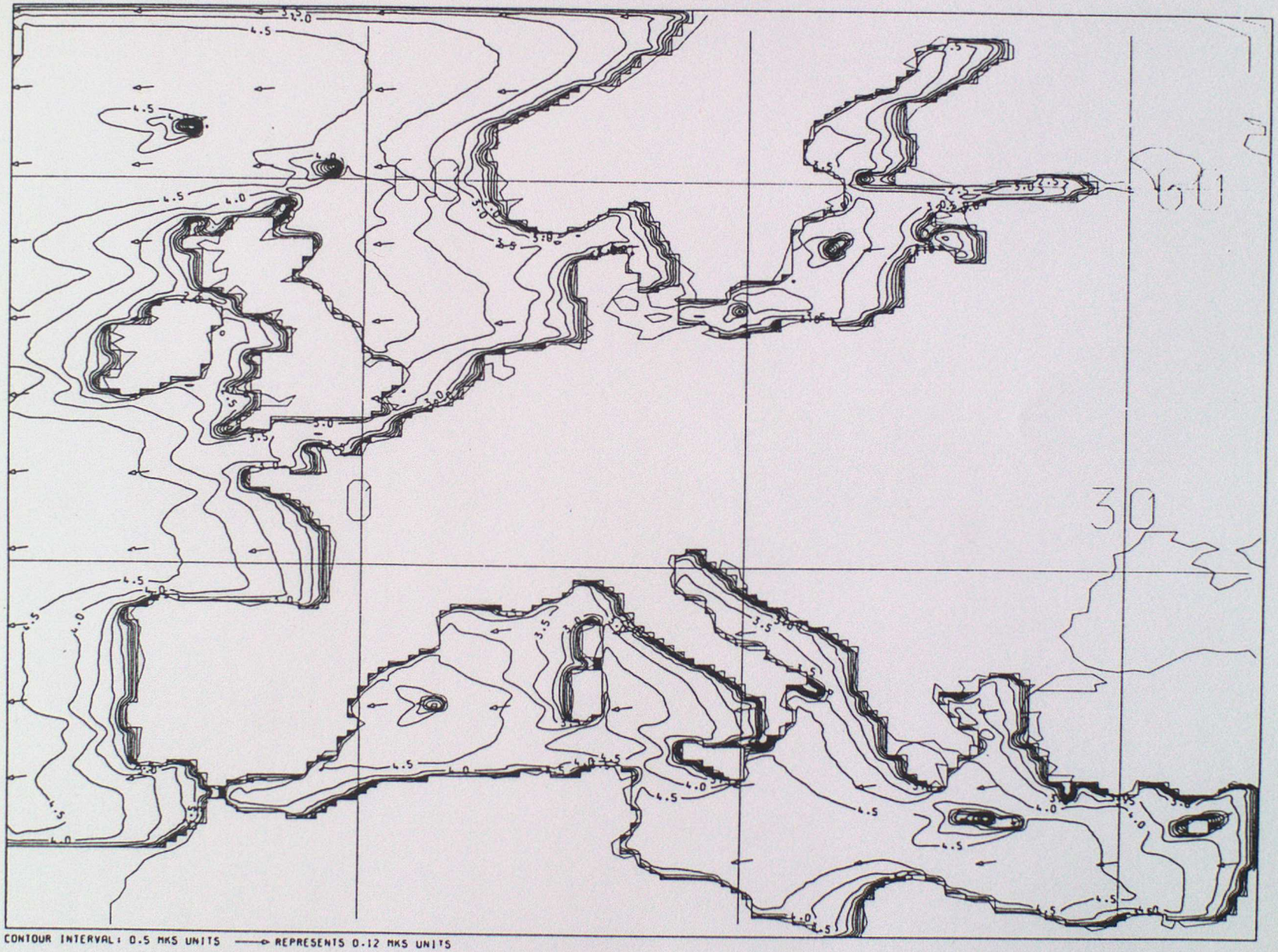

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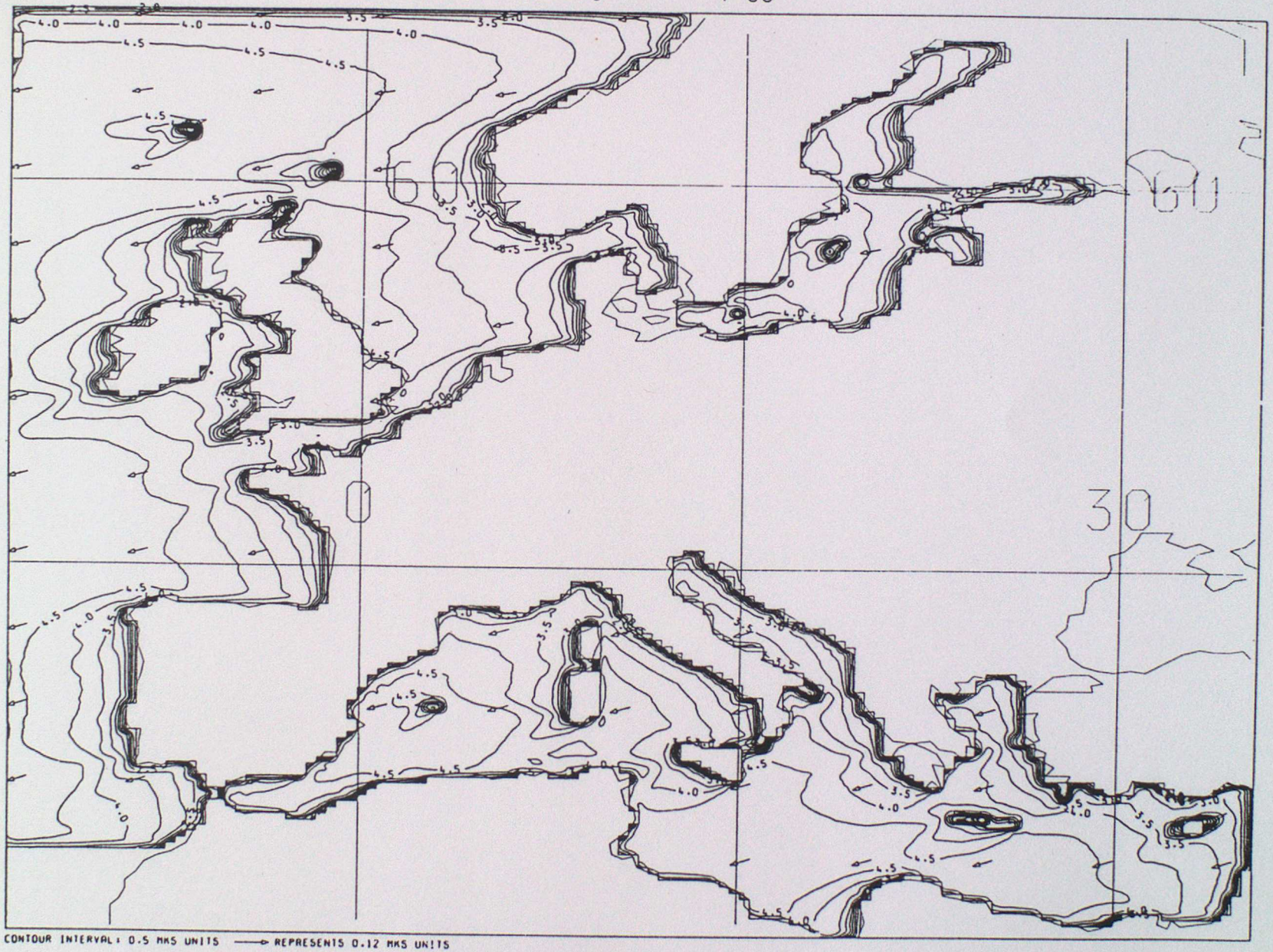

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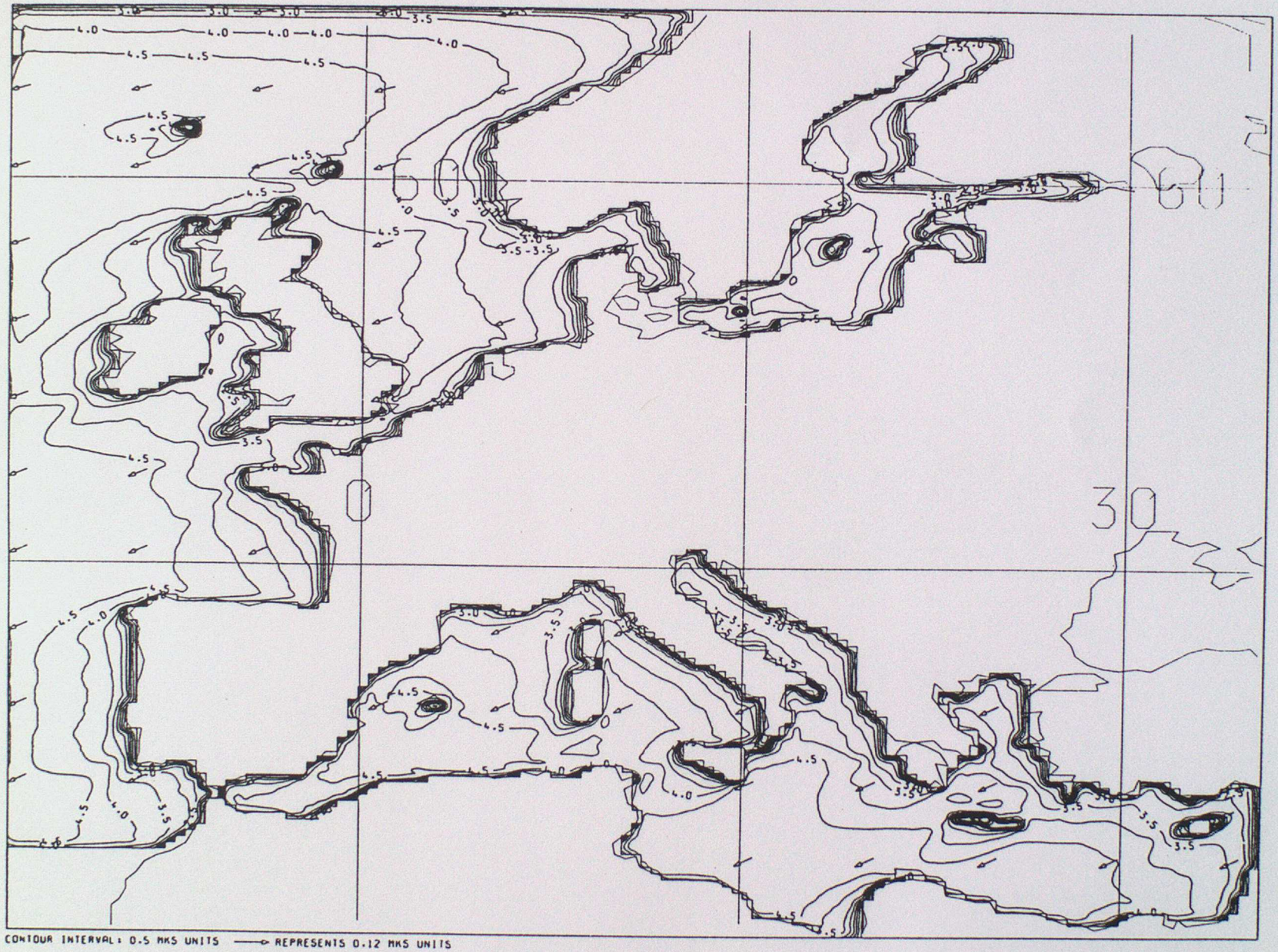

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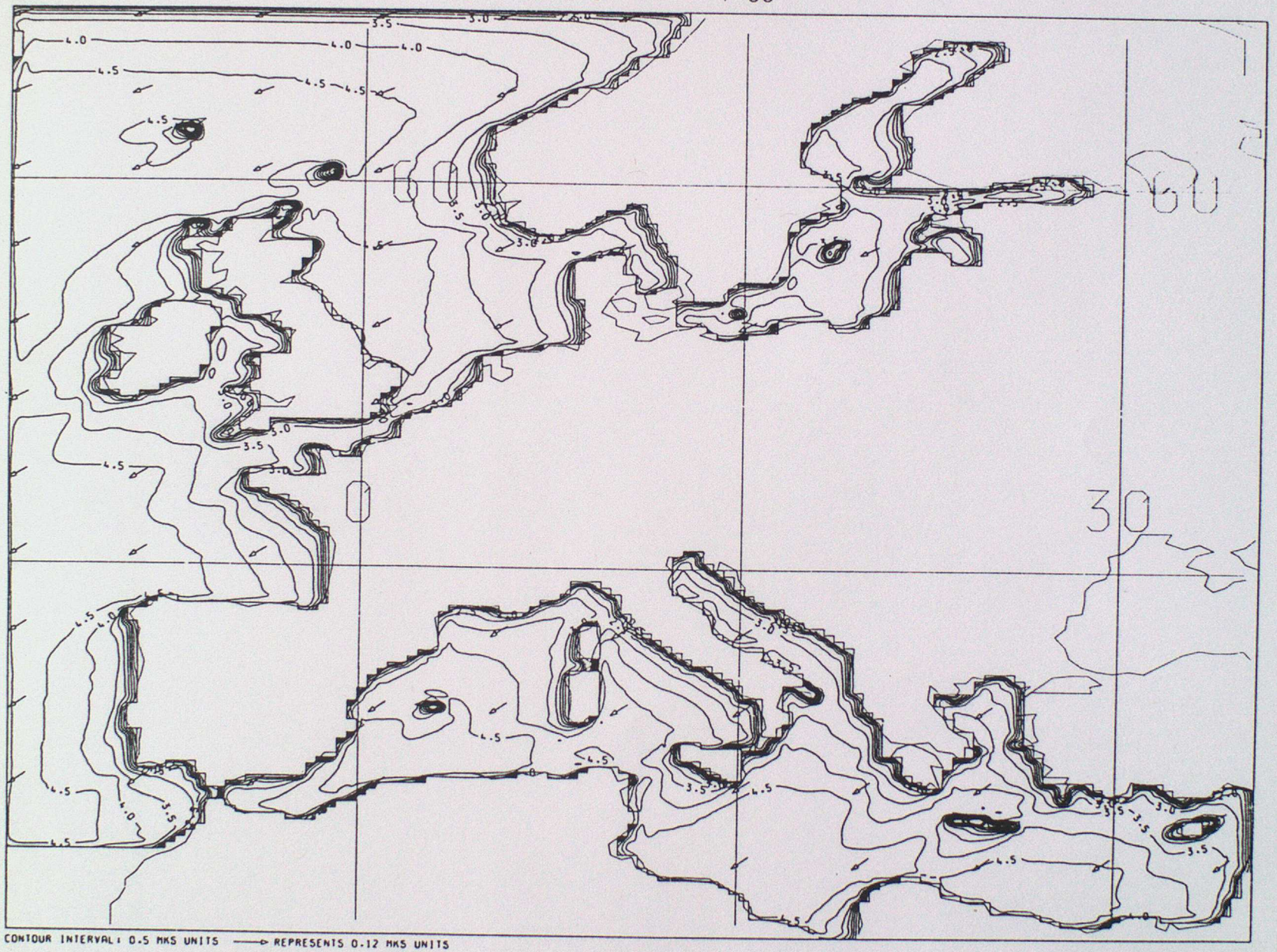

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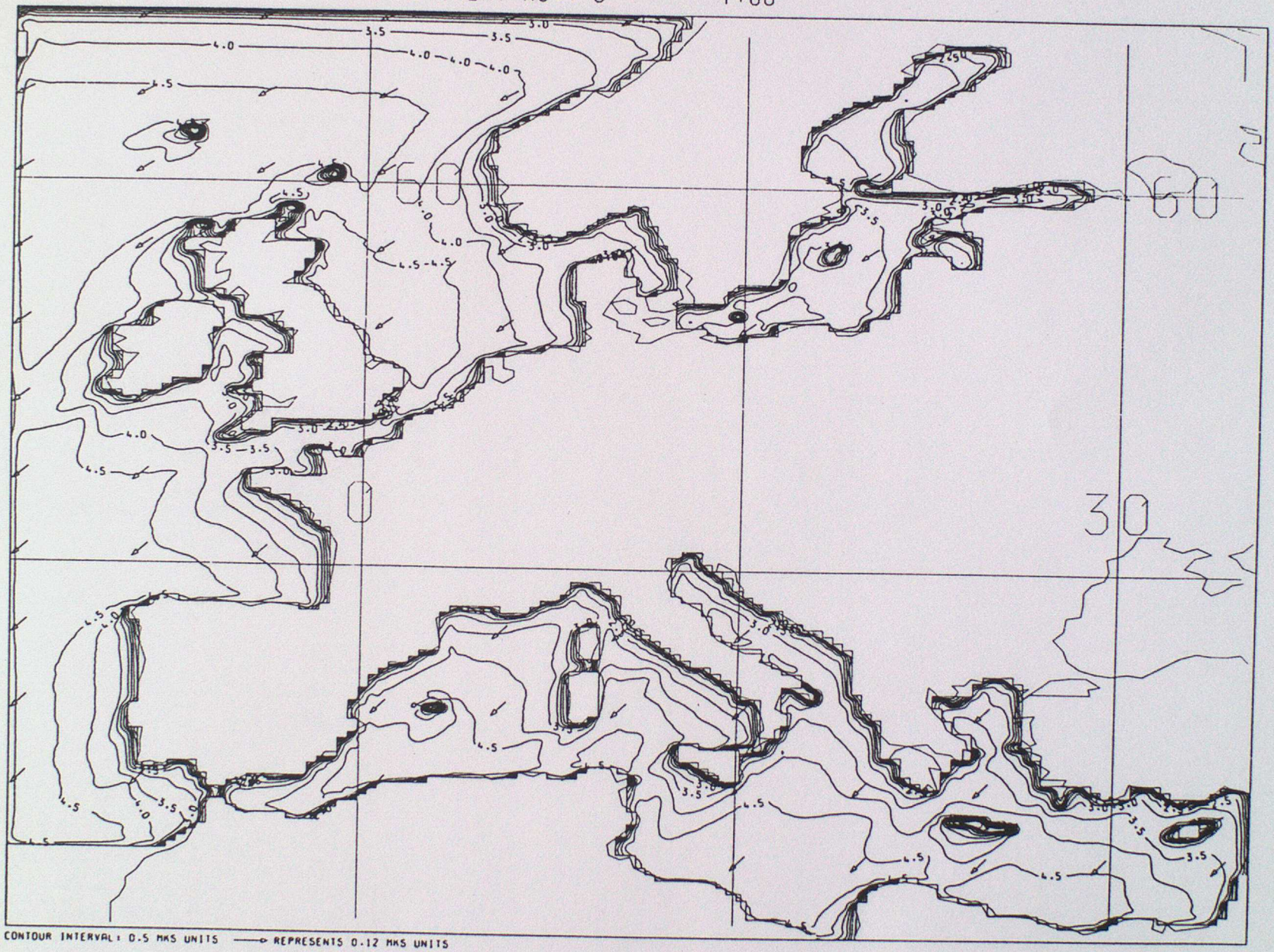

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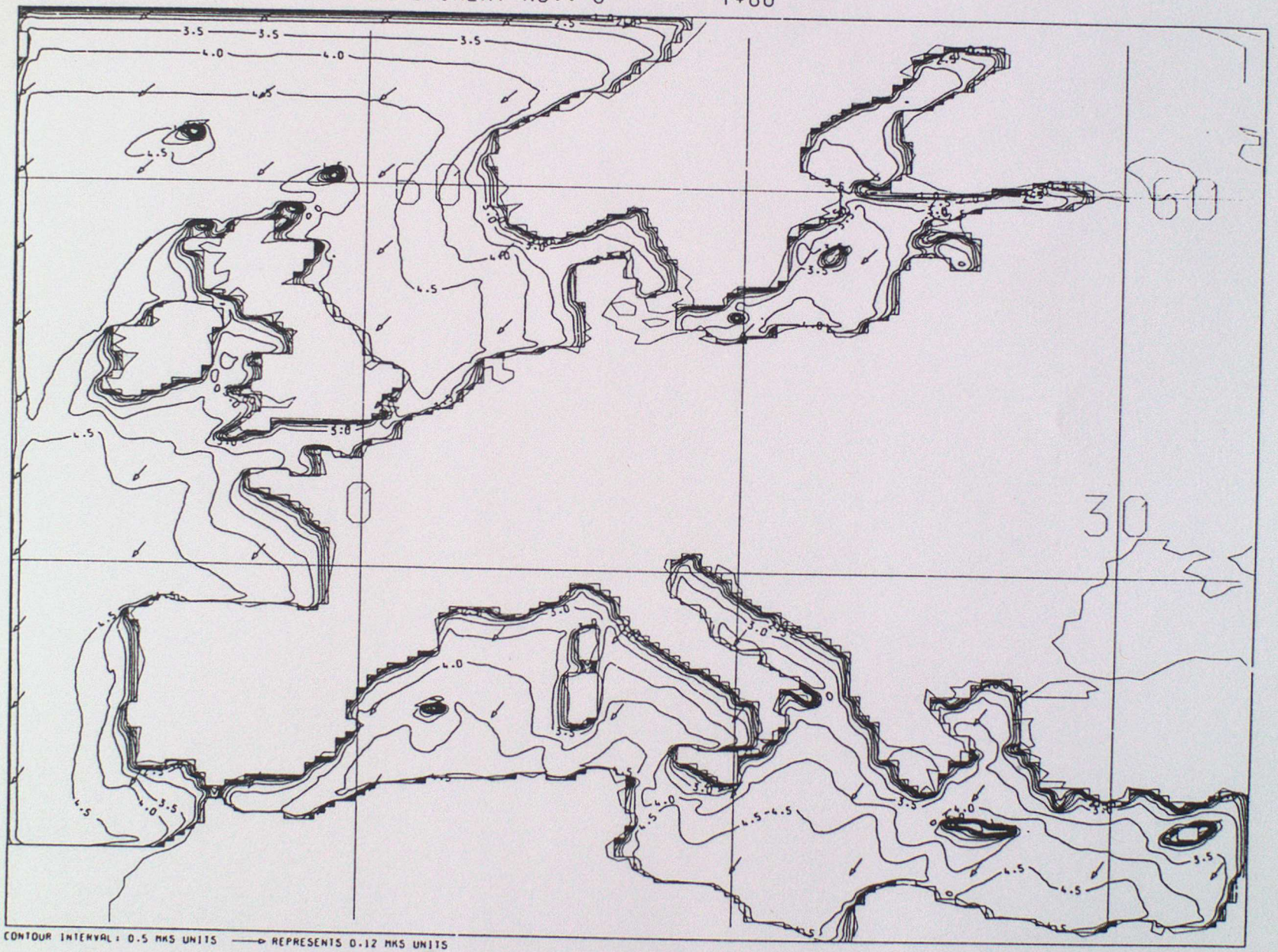

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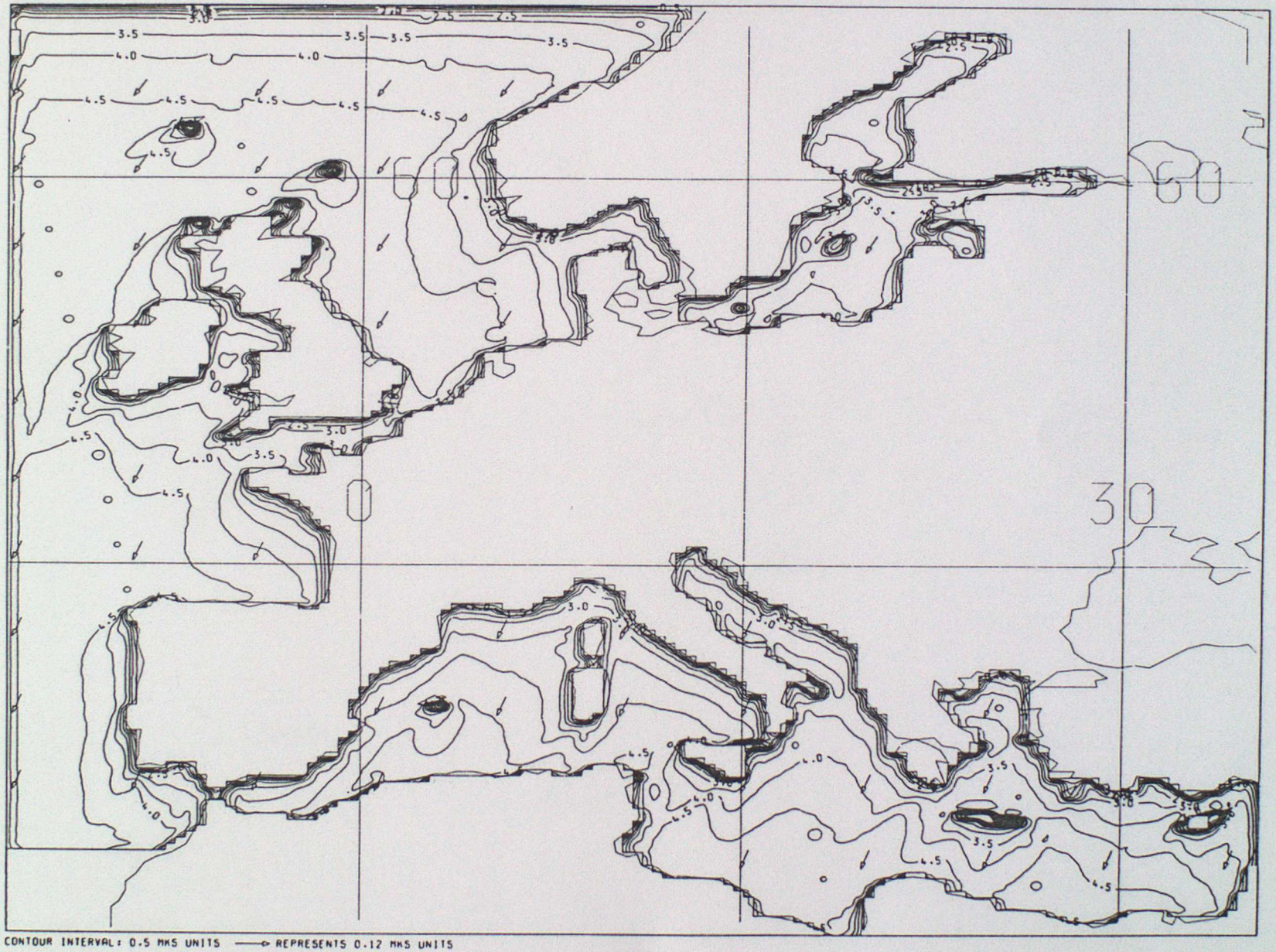

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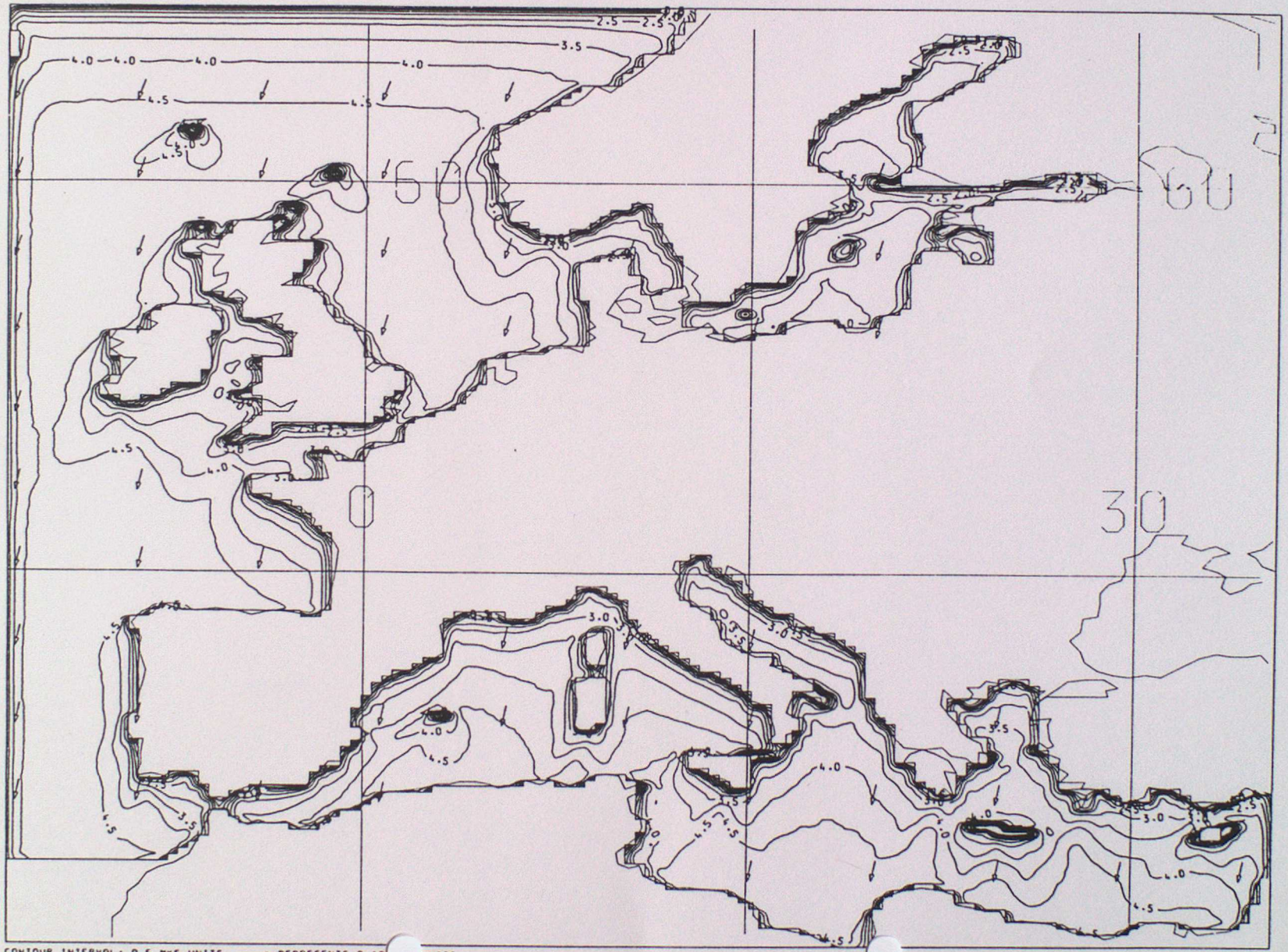

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SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
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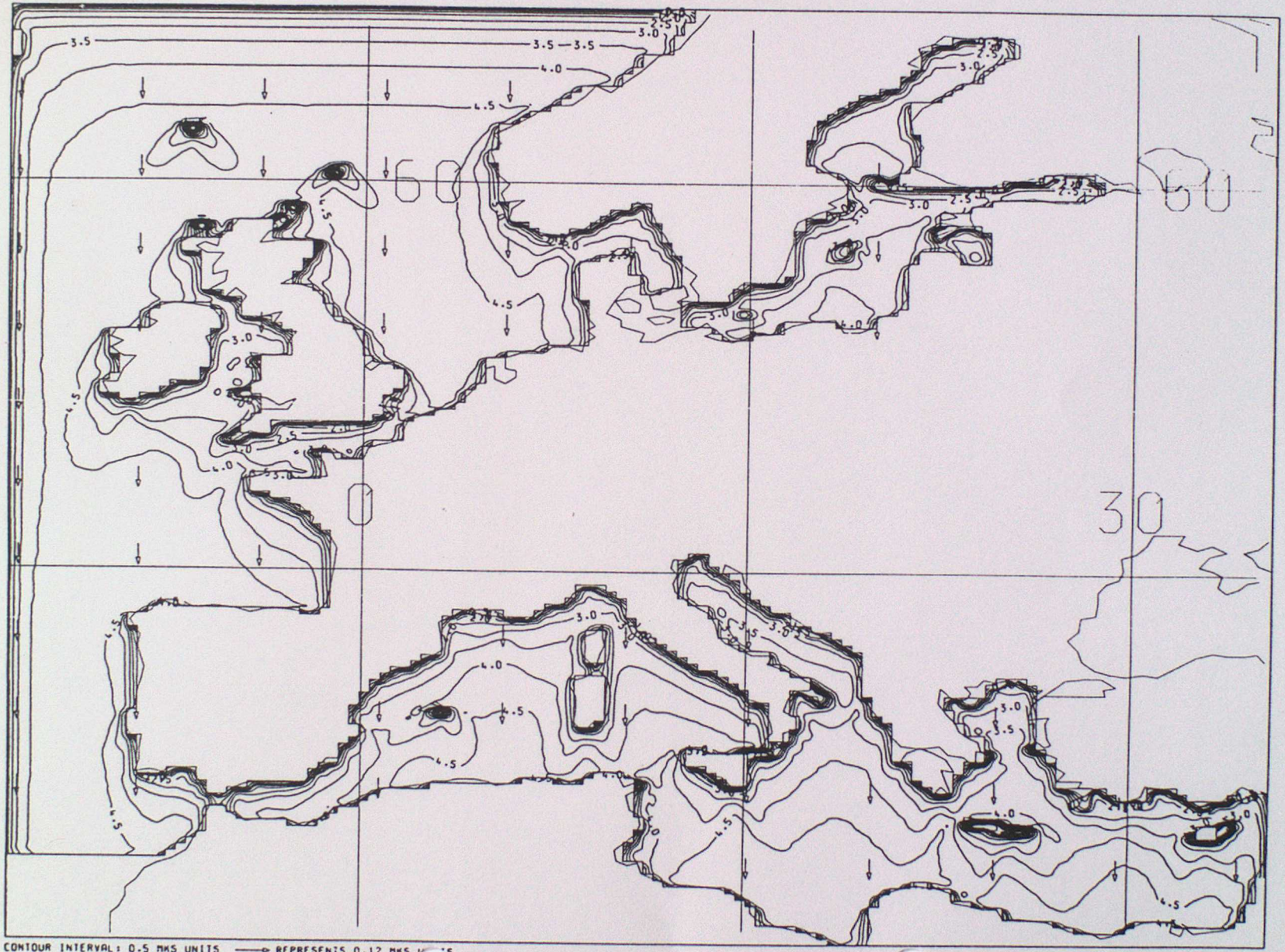

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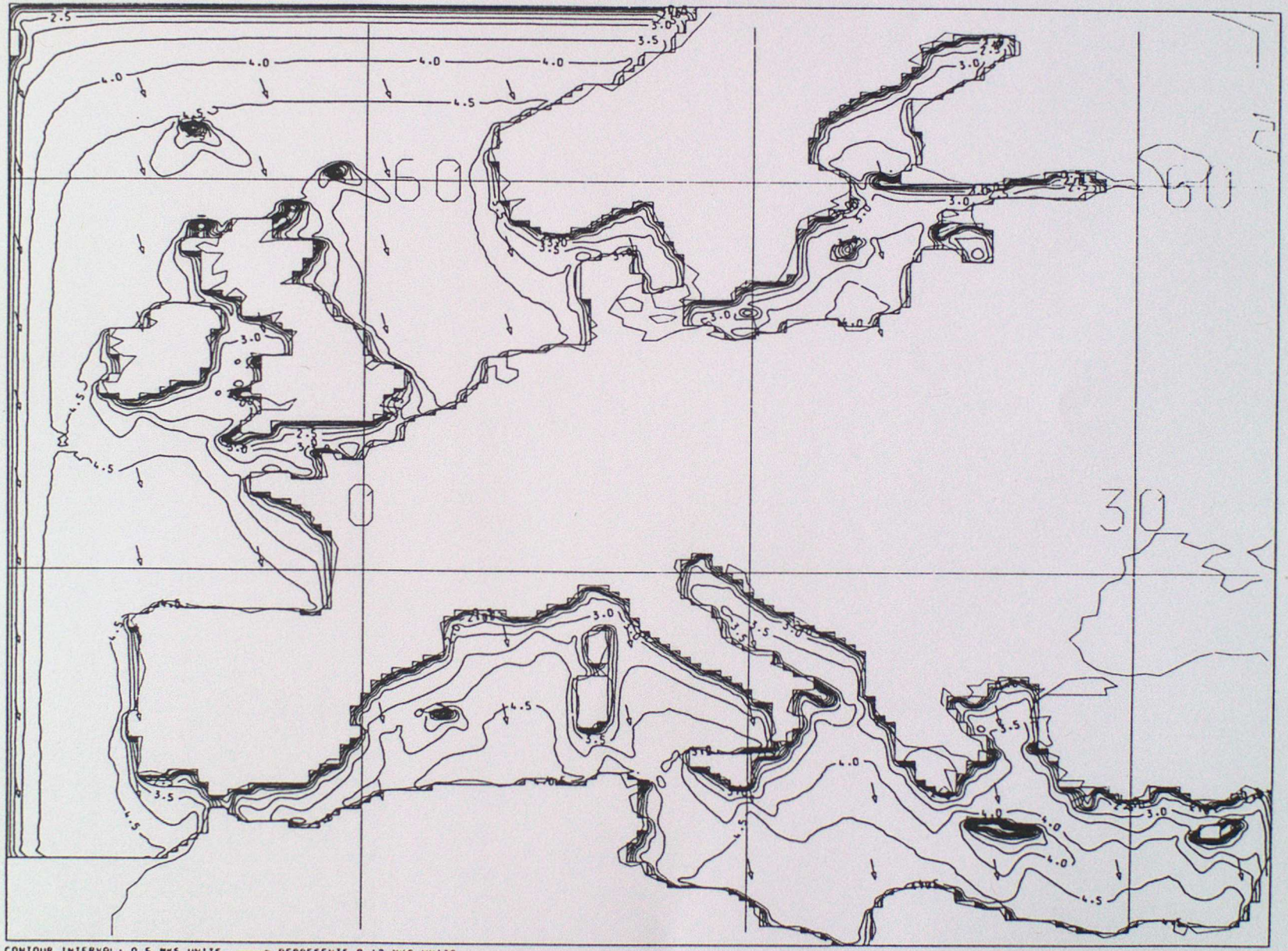

CONTOUR INTERVAL: 0.5 MKS UNITS ——> REPRESENTS 0.12 MKS UNITS

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SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
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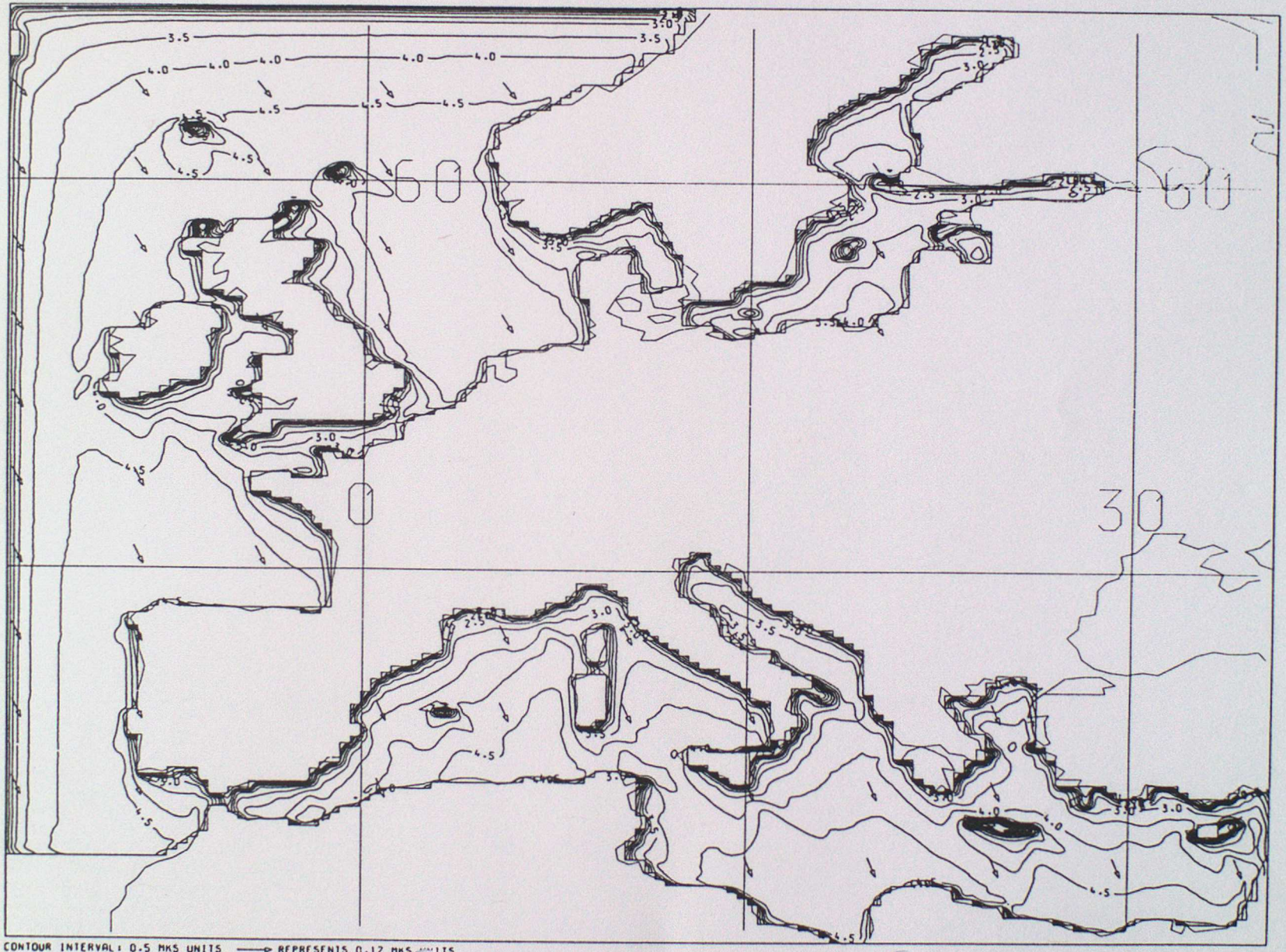

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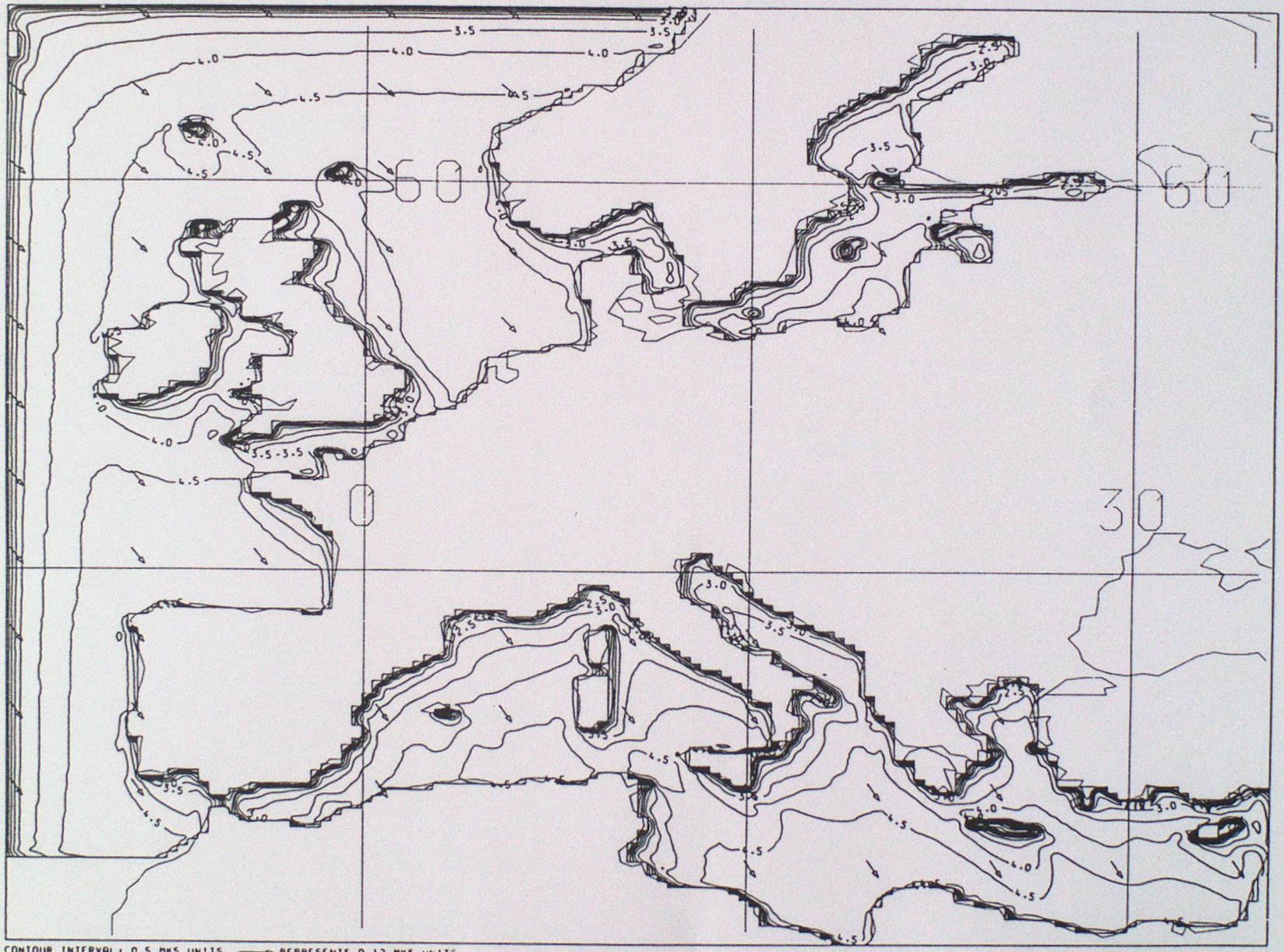
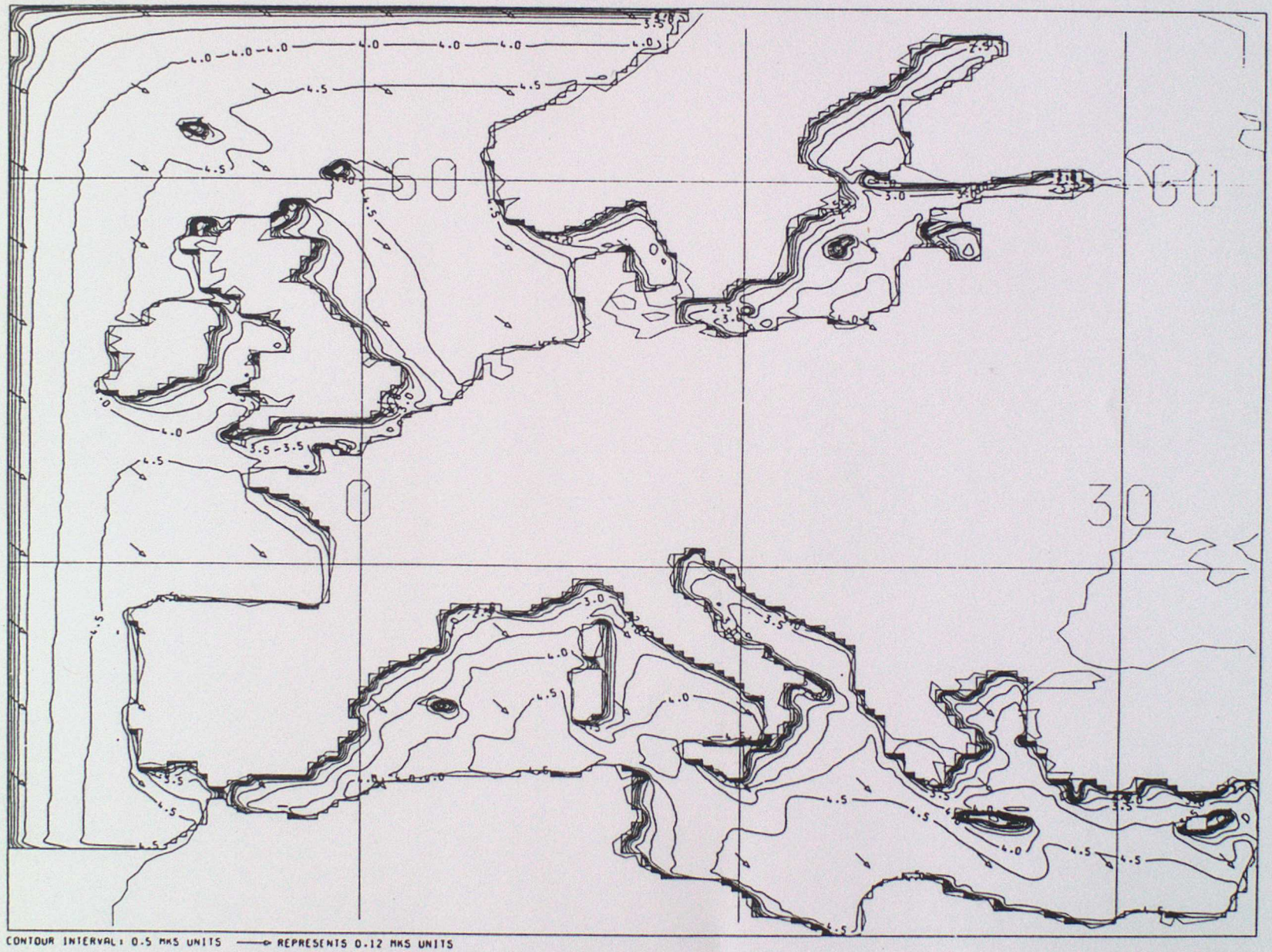
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993
SURFACE EXPERIMENT NO.: 8 T+60

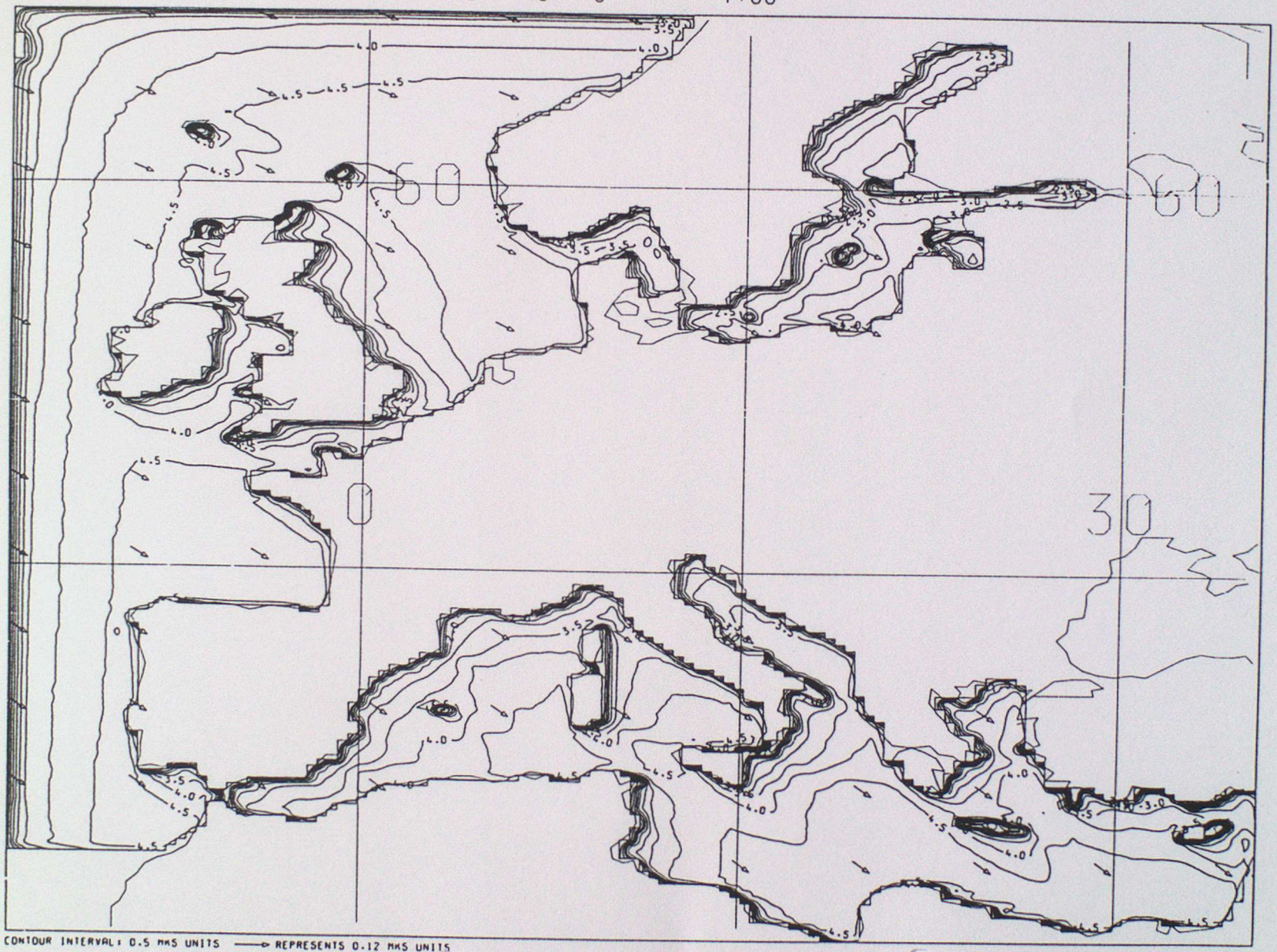


EUROPEAN GRID DEEP FETCH 15M/S 320 DEG
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993
SURFACE EXPERIMENT NO.: 8 T+60

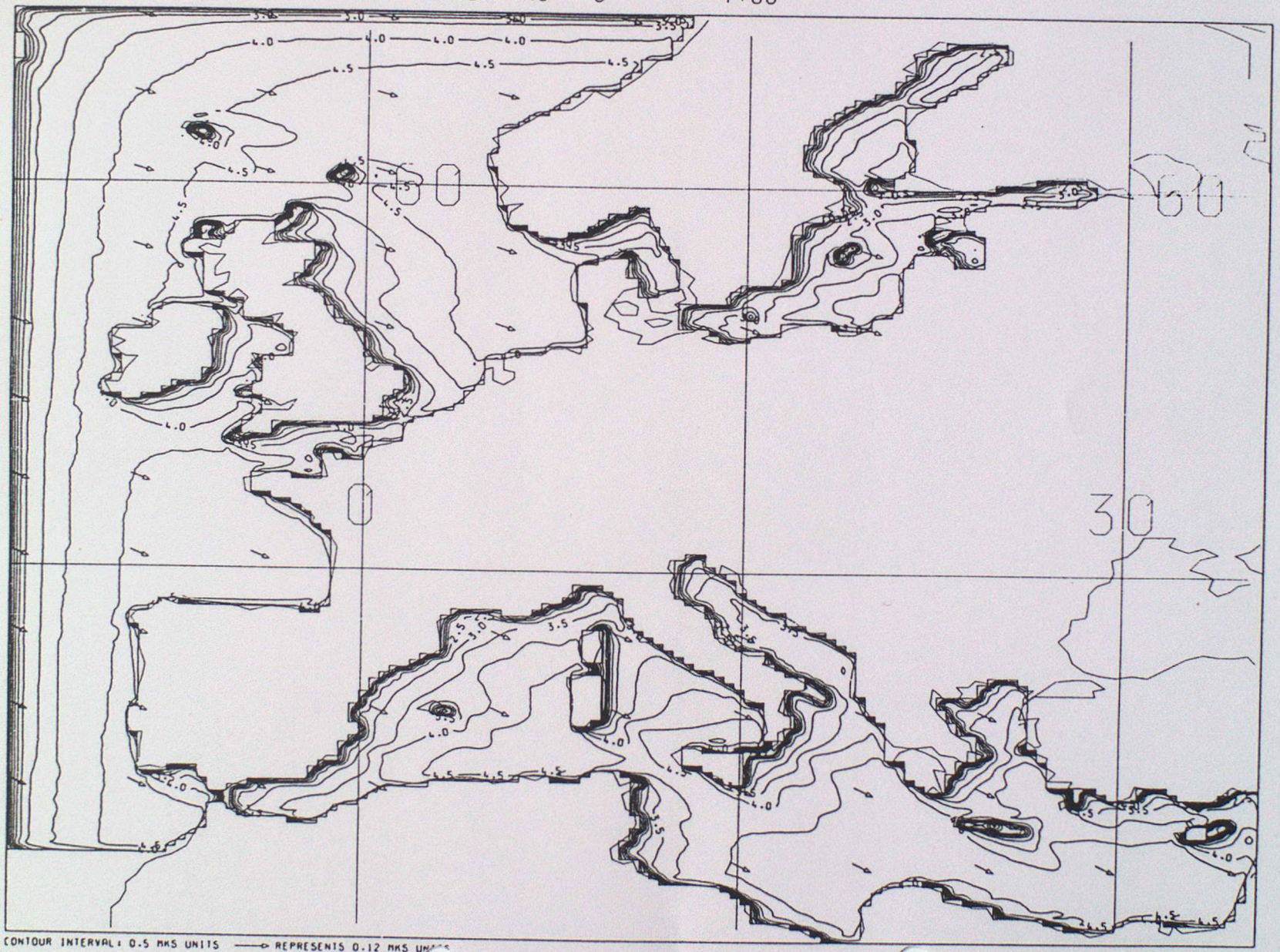


CONTOUR INTERVAL: 0.5 MKS UNITS —⟶ REPRESENTS 0.12 MKS UNITS

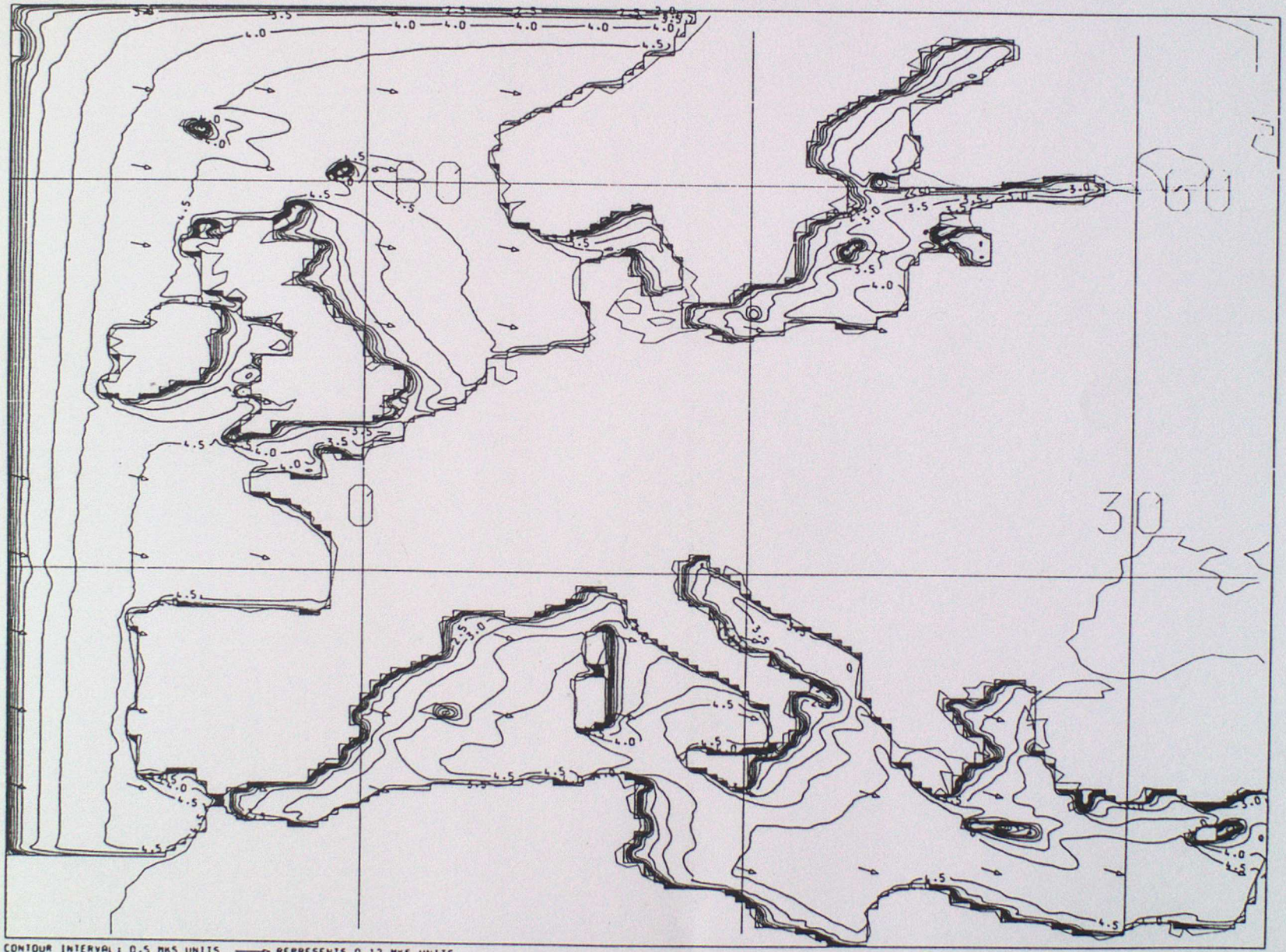
EUROPEAN GRID DEEP FETCH 15M/S 310 DEG
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993
SURFACE EXPERIMENT NO.: 8 T+60



EUROPEAN GRID DEEP FETCH 15M/S 300 DEG
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993
SURFACE EXPERIMENT NO.: 8 T+60

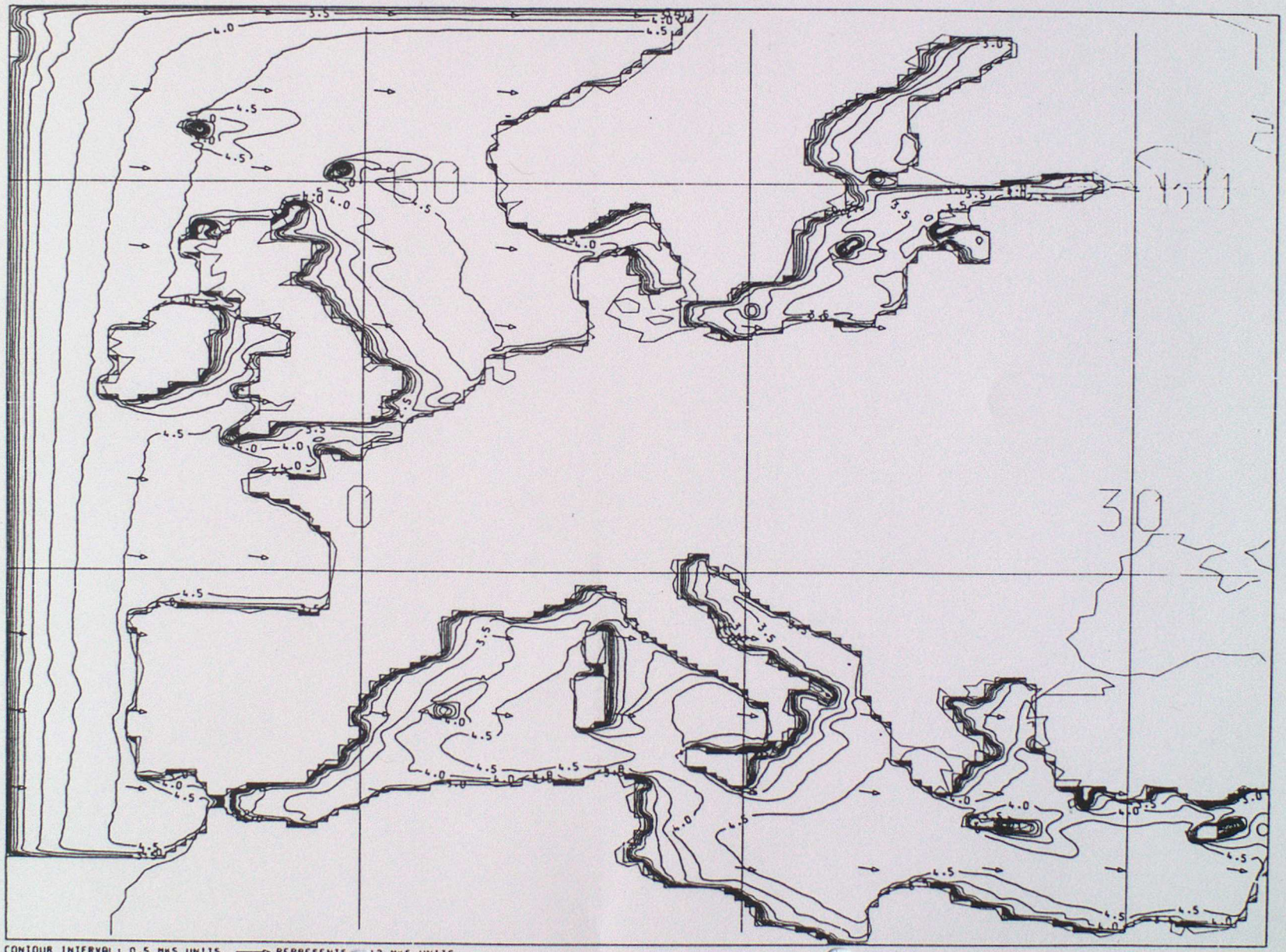


EUROPEAN GRID DEEP FETCH 15M/S 290 DEG
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993
SURFACE EXPERIMENT NO.: 8 T+60



CONTOUR INTERVAL: 0.5 MKS UNITS ——→ REPRESENTS 0.12 MKS UNITS

EUROPEAN GRID DEEP FETCH 15M/S 280 DEG
SEA+SWELL CONTOURS (M) / WIND DIRECTION (->) /
VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993
SURFACE EXPERIMENT NO.: 8 T+60

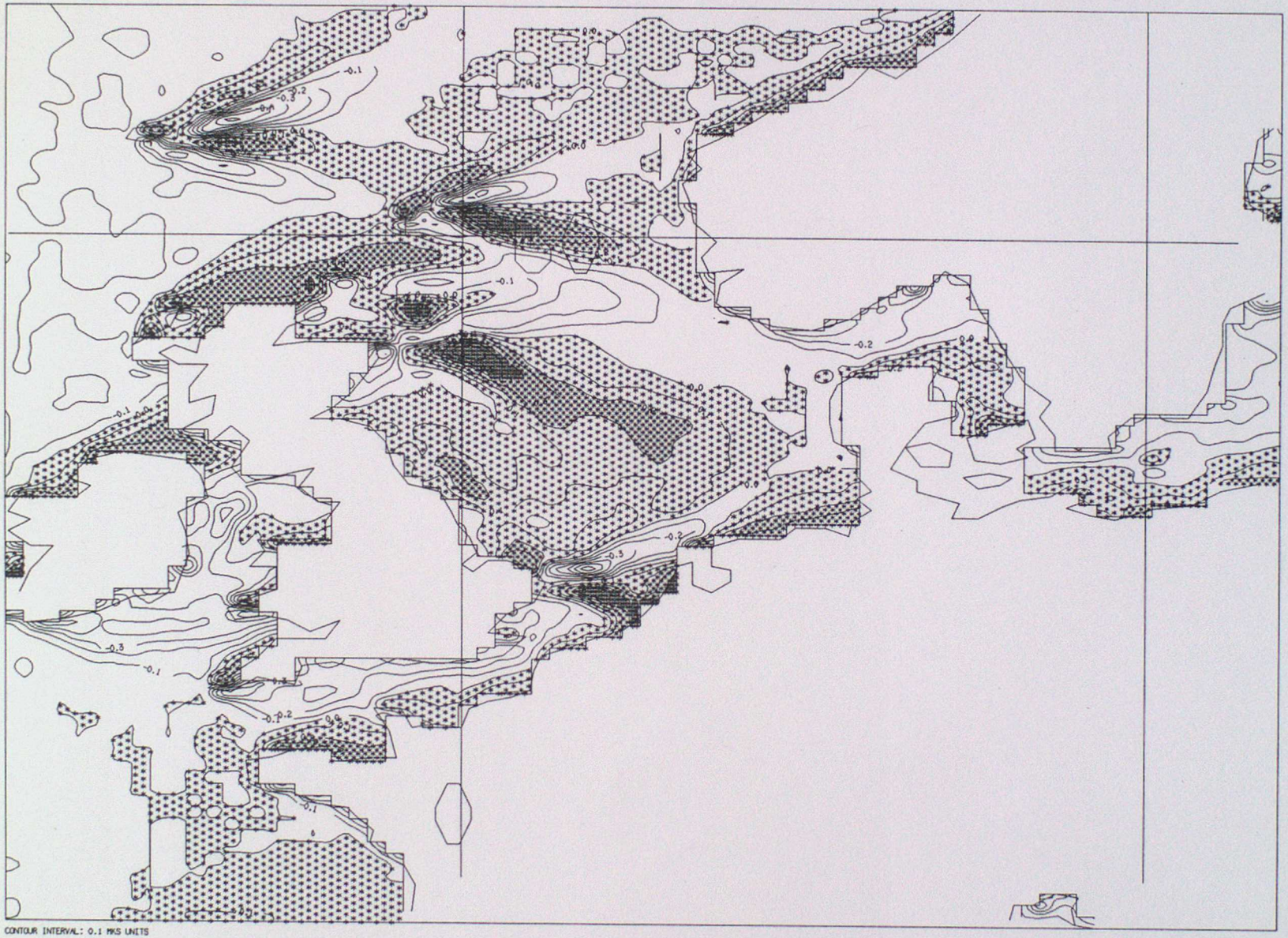


WAVE HEIGHT DIFFERENCE U=15m/s 270 degrees minus U=15 / 260 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



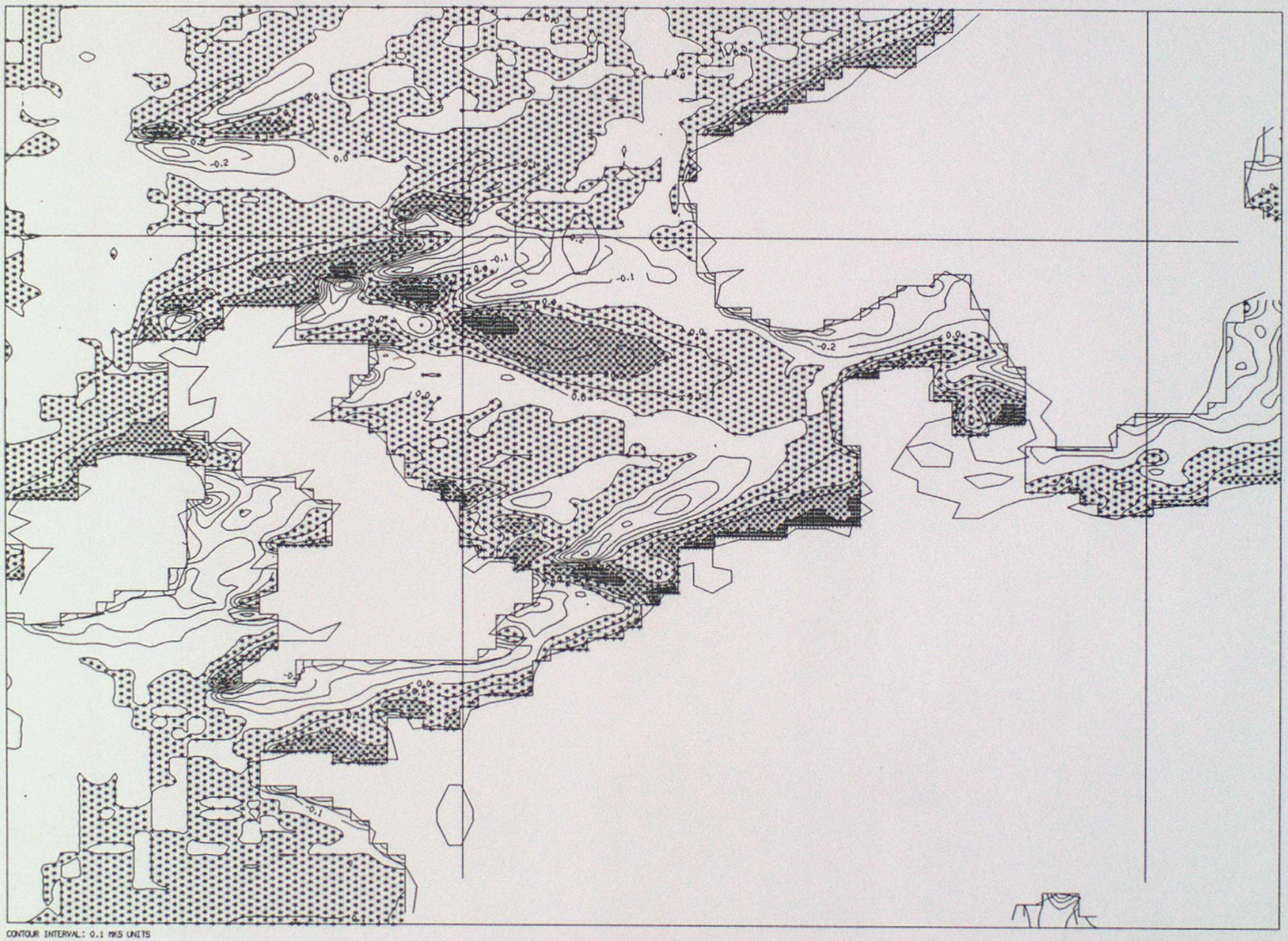
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 260 degrees minus U=15 / 250 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



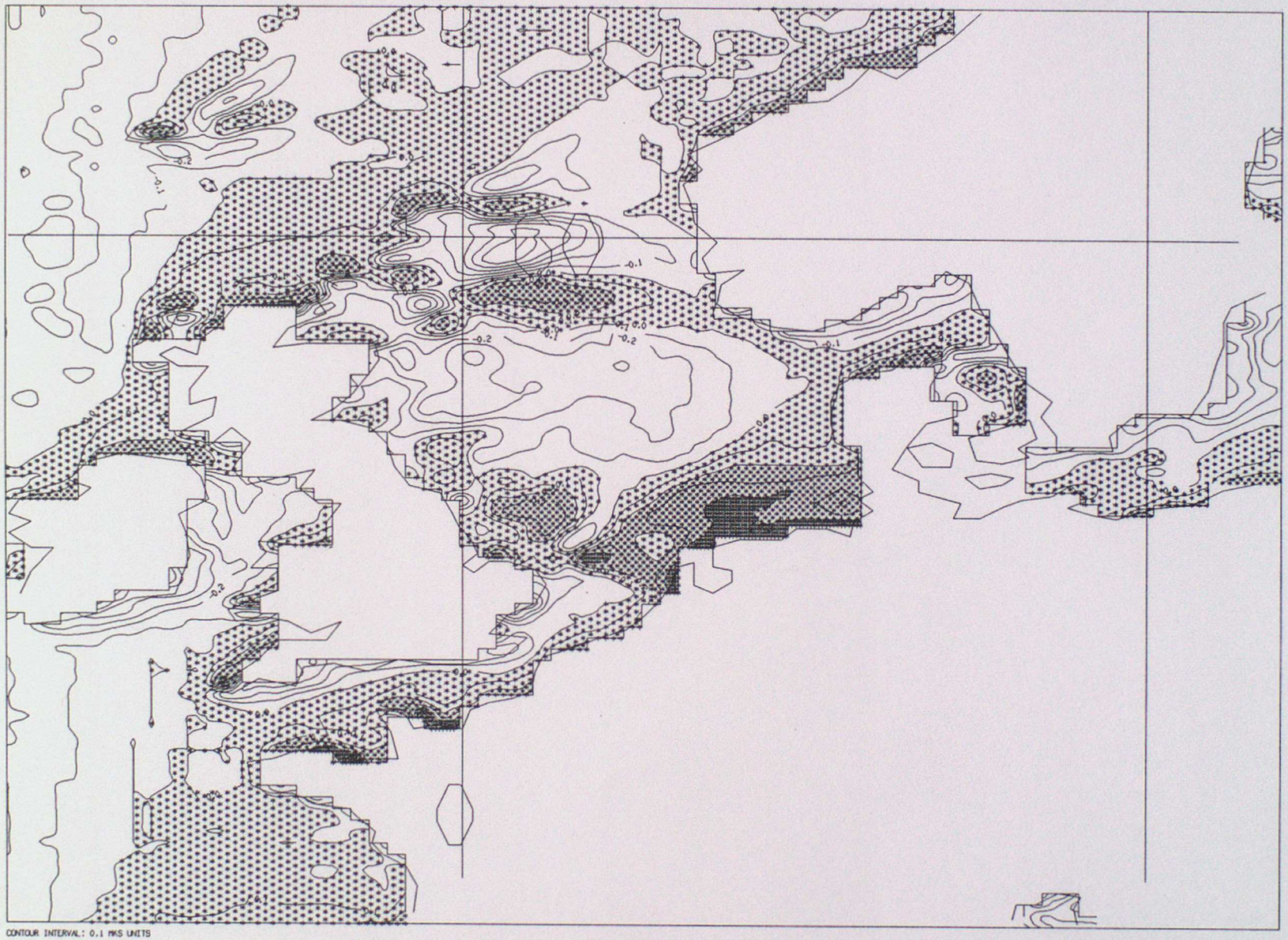
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 250 degrees minus U=15 / 240 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



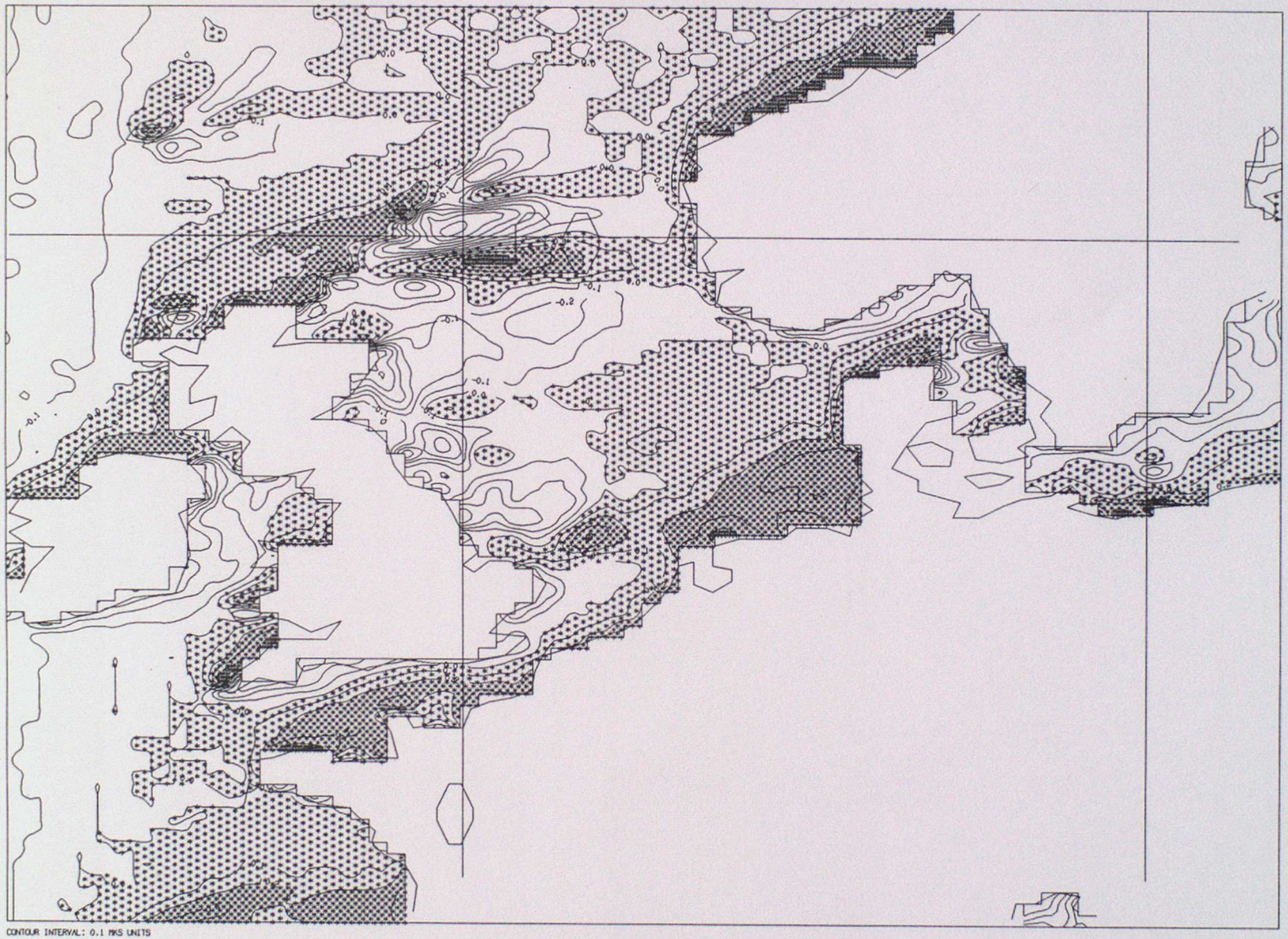
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 240 degrees minus U=15 / 230 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



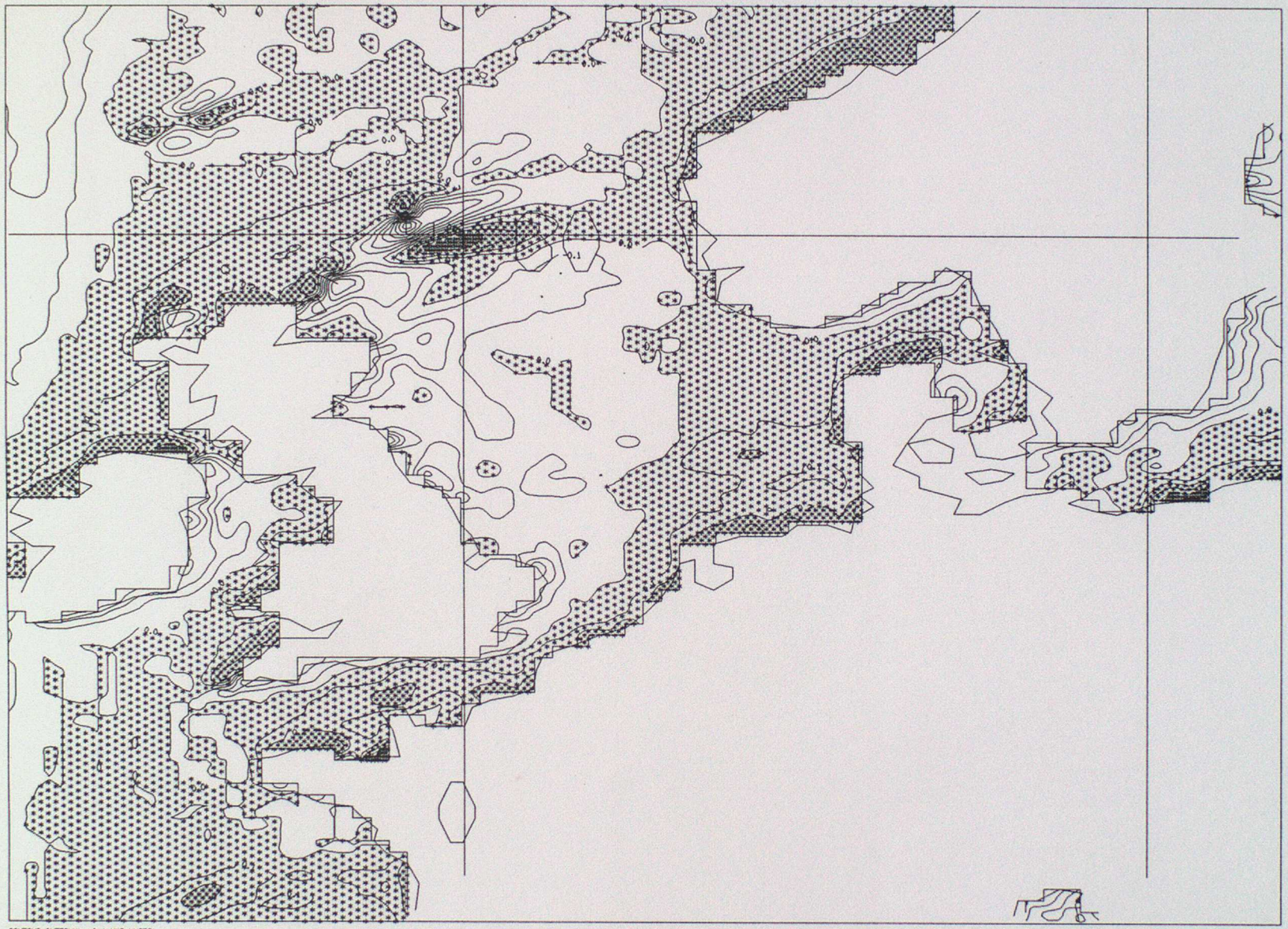
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 230 degrees minus U=15 / 220 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



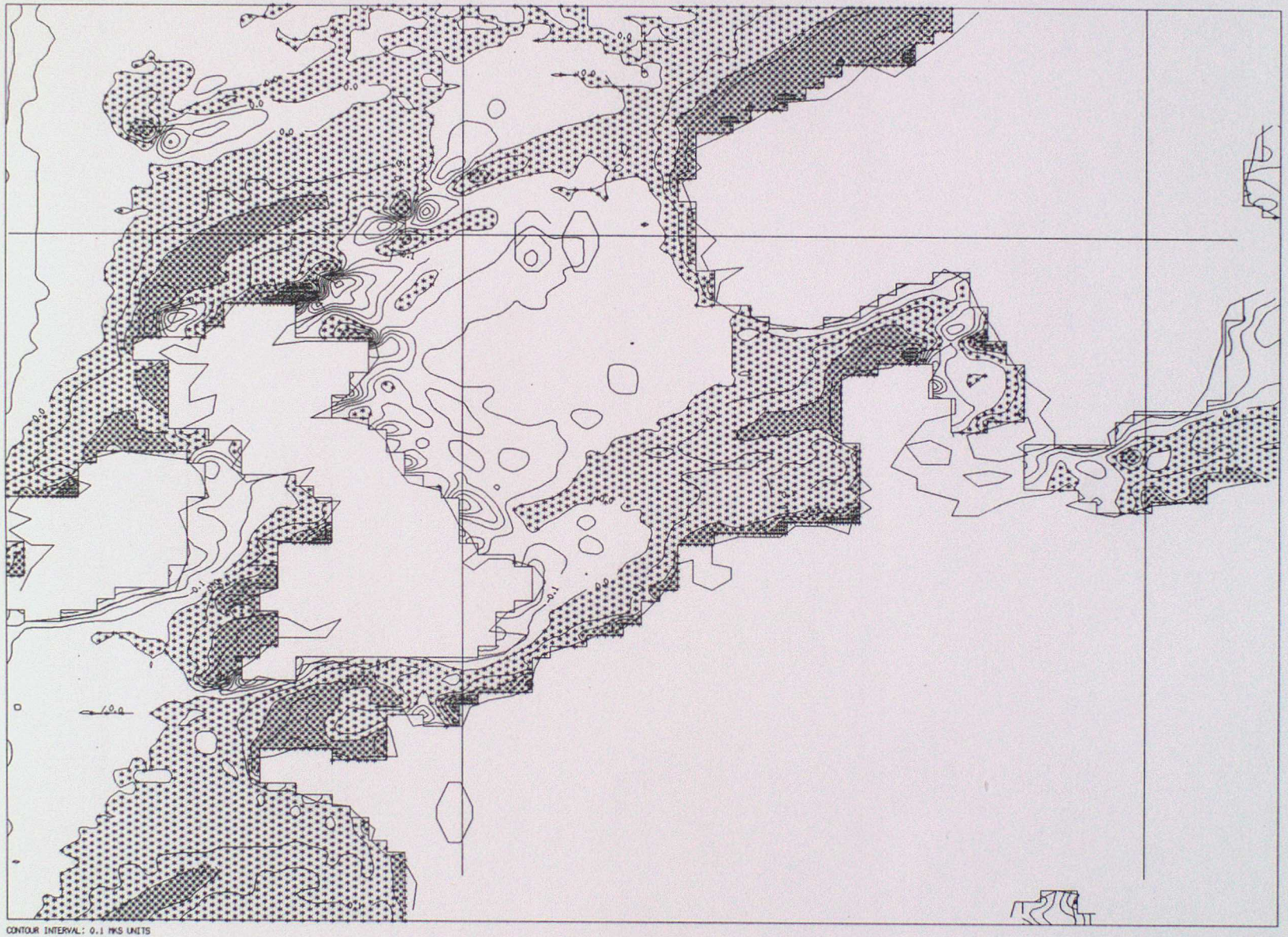
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 220 degrees minus U=15 / 210 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



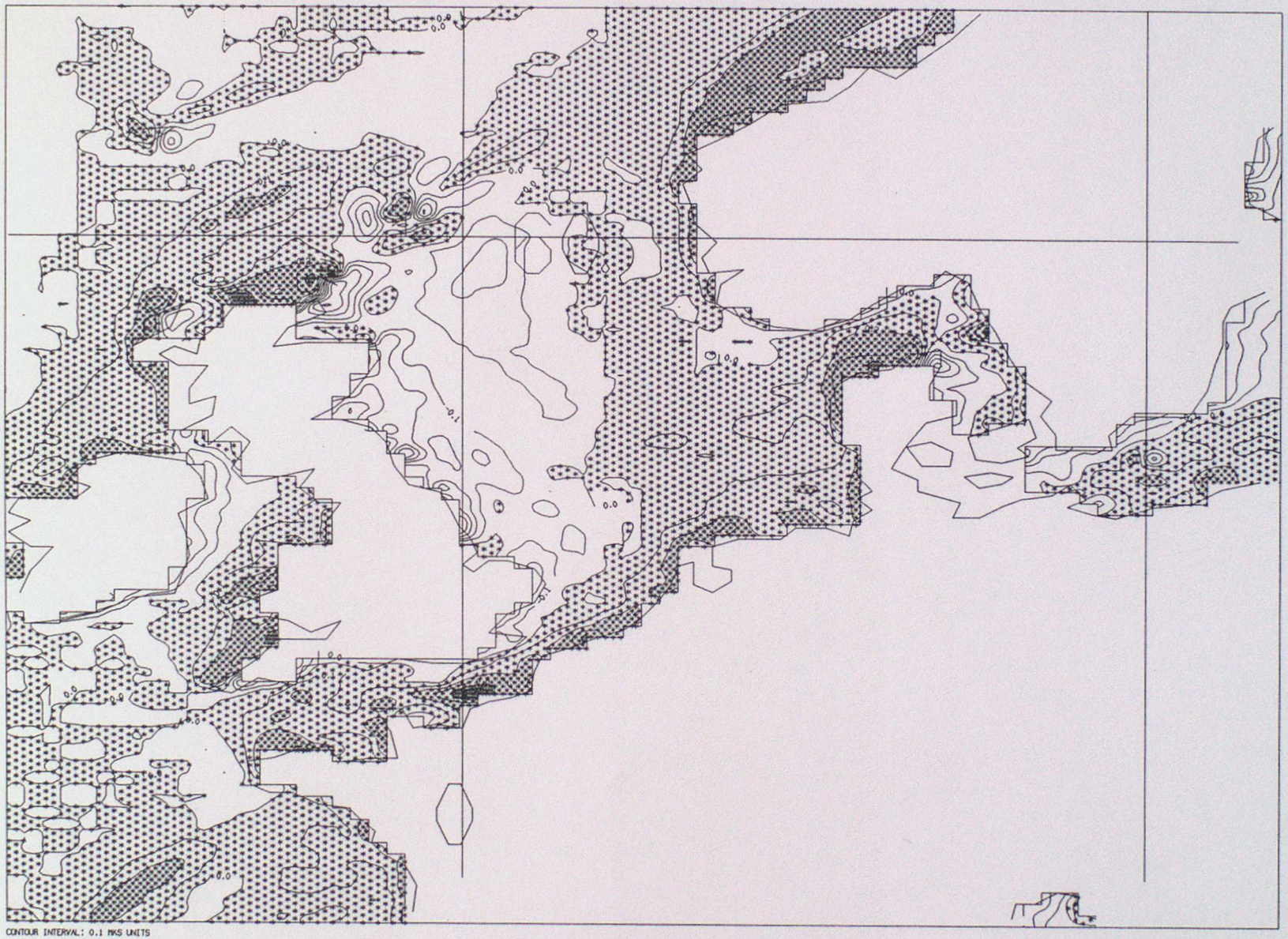
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 210 degrees minus U=15 / 200 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



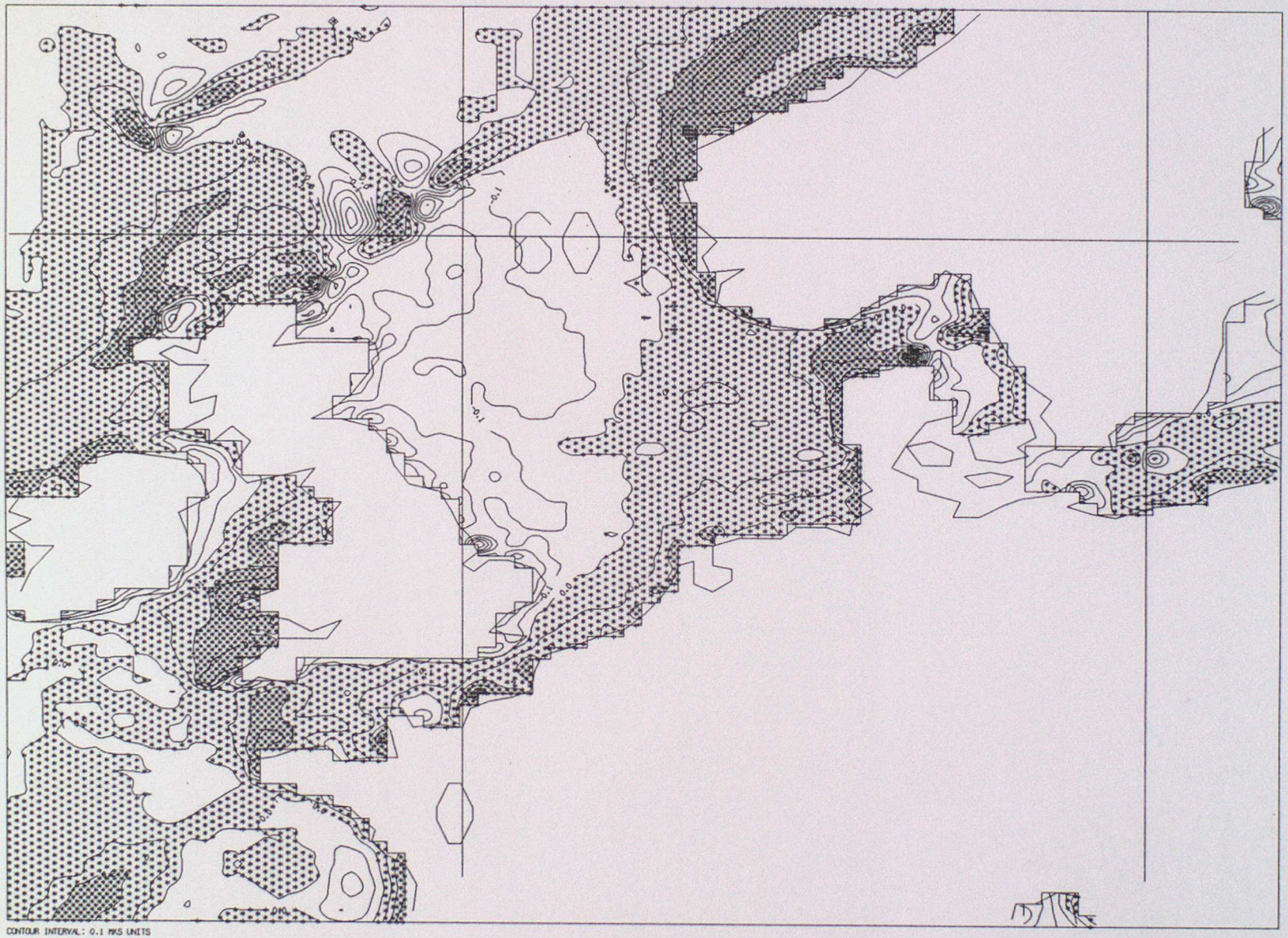
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 200 degrees minus U=15 / 190 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



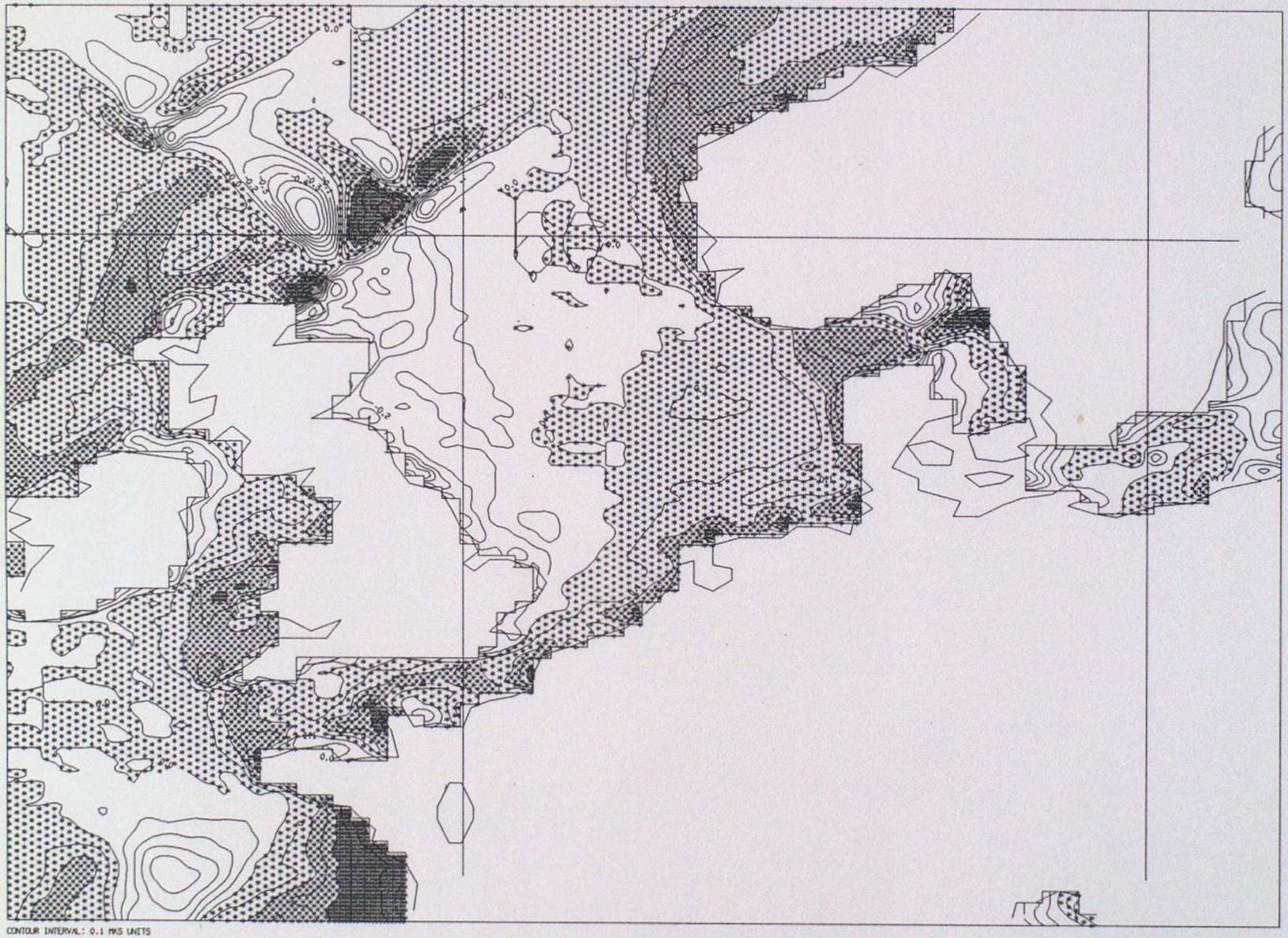
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 190 degrees minus U=15 / 180 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



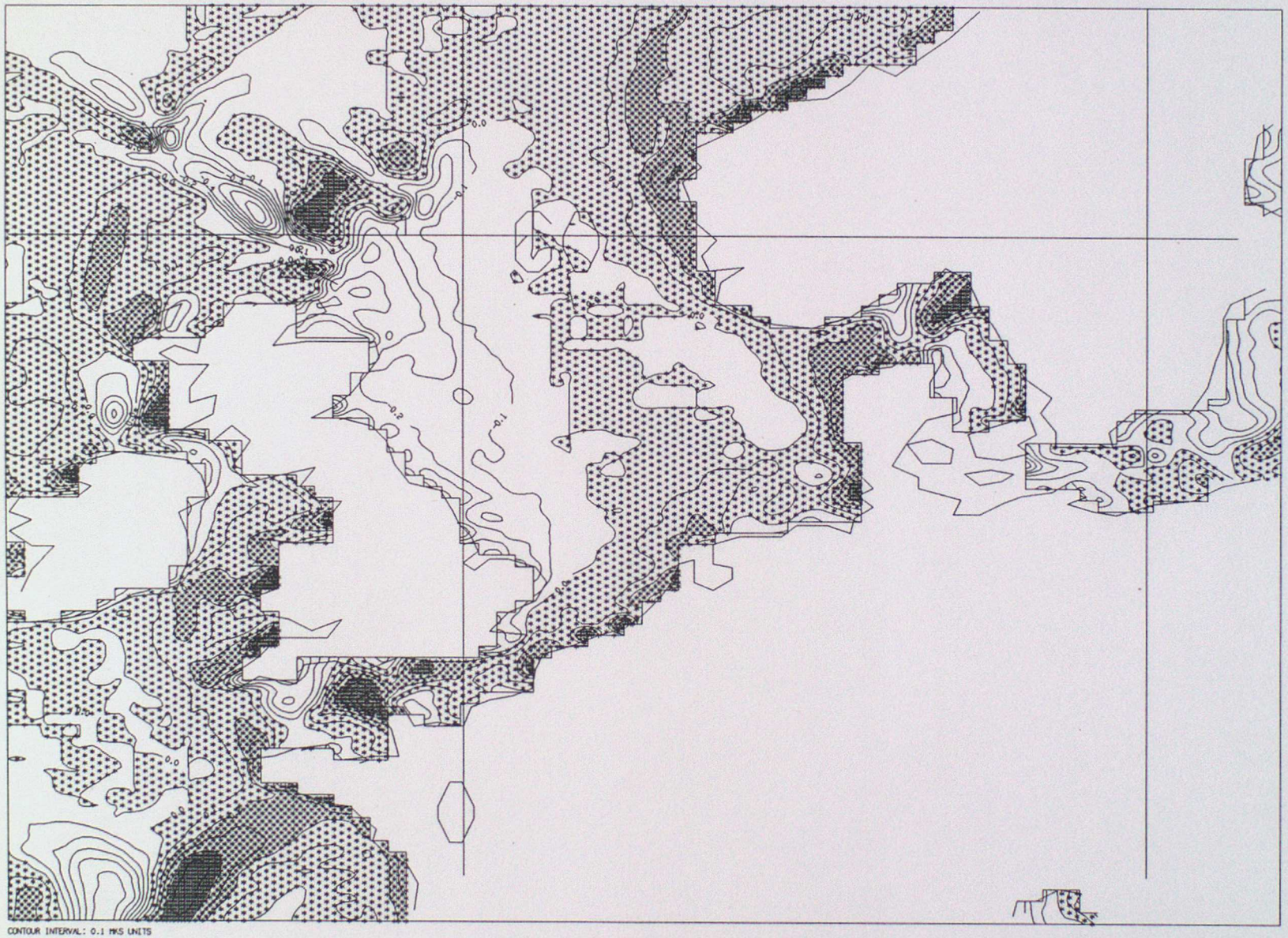
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 180 degrees minus U=15 / 170 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



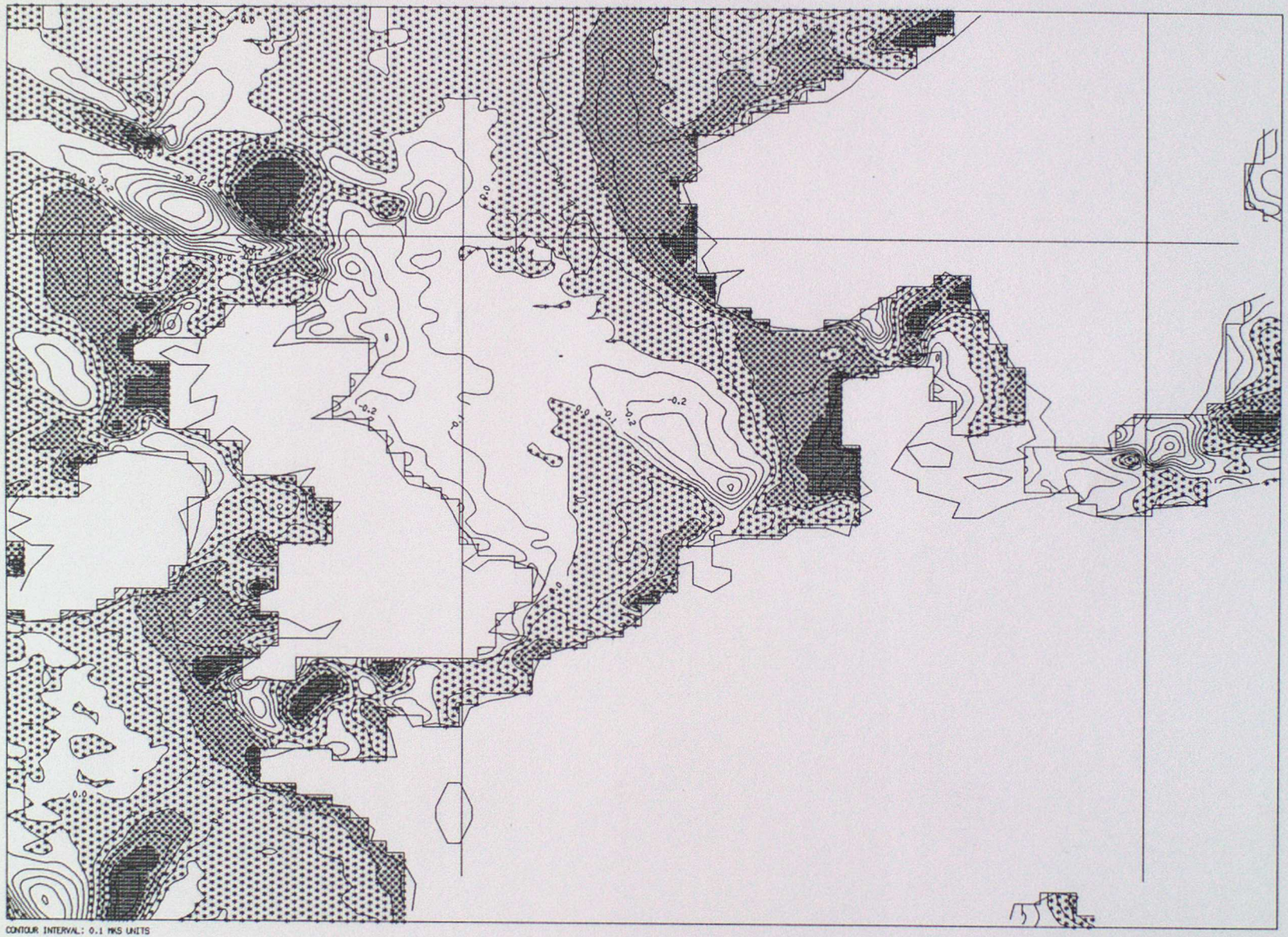
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 170 degrees minus U=15 / 160 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



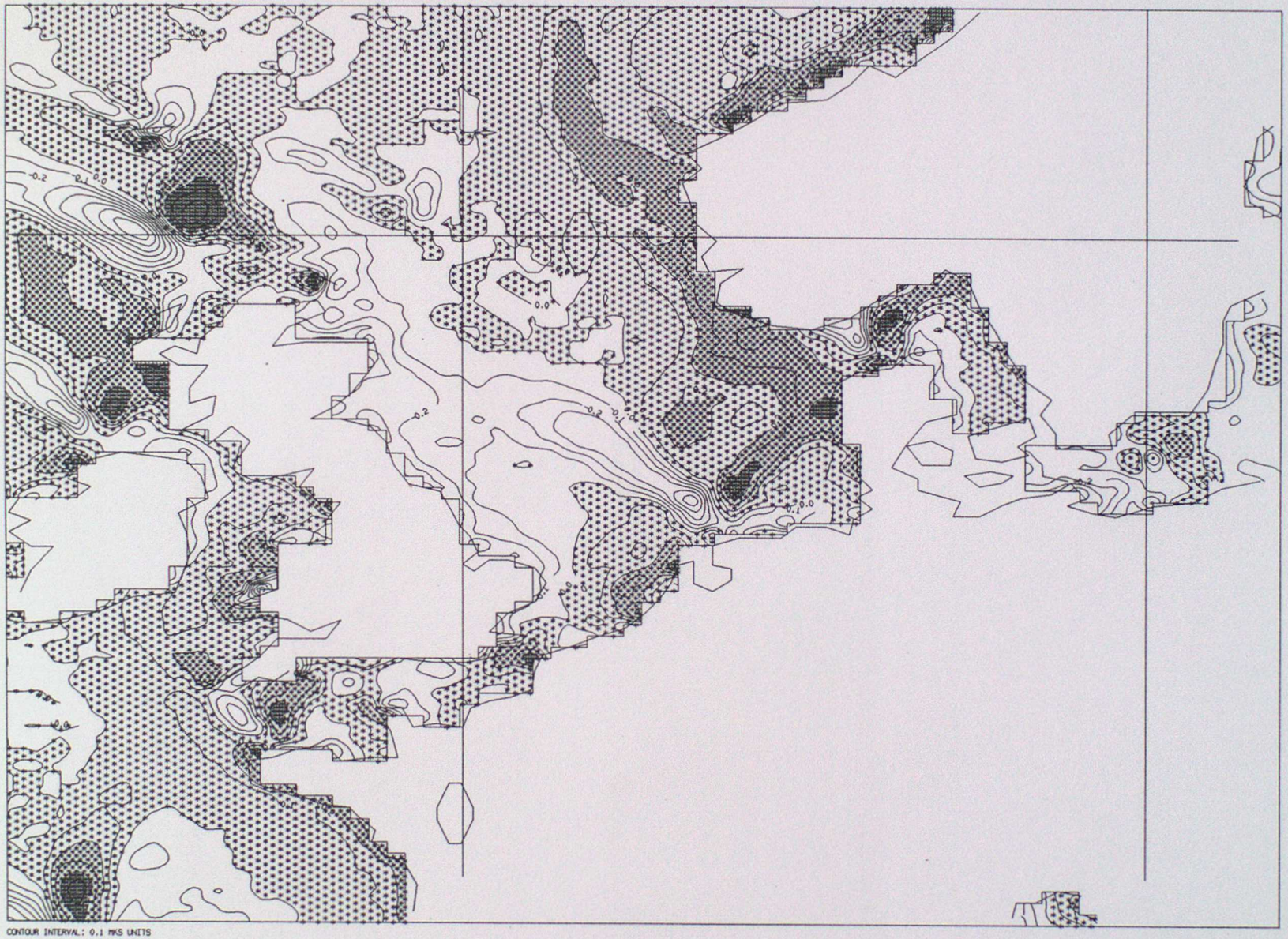
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 160 degrees minus U=15 / 150 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



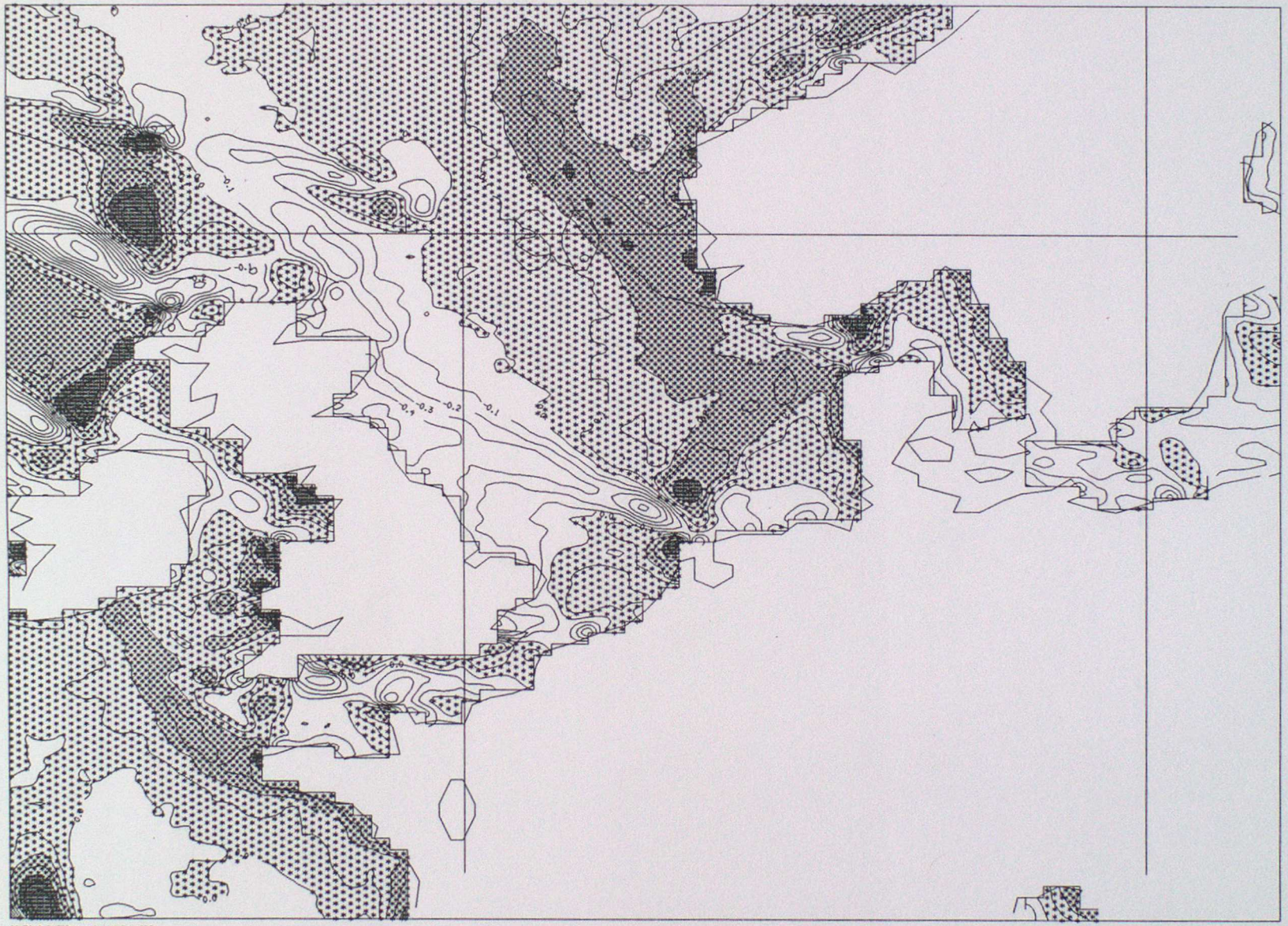
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 150 degrees minus U=15 / 140 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



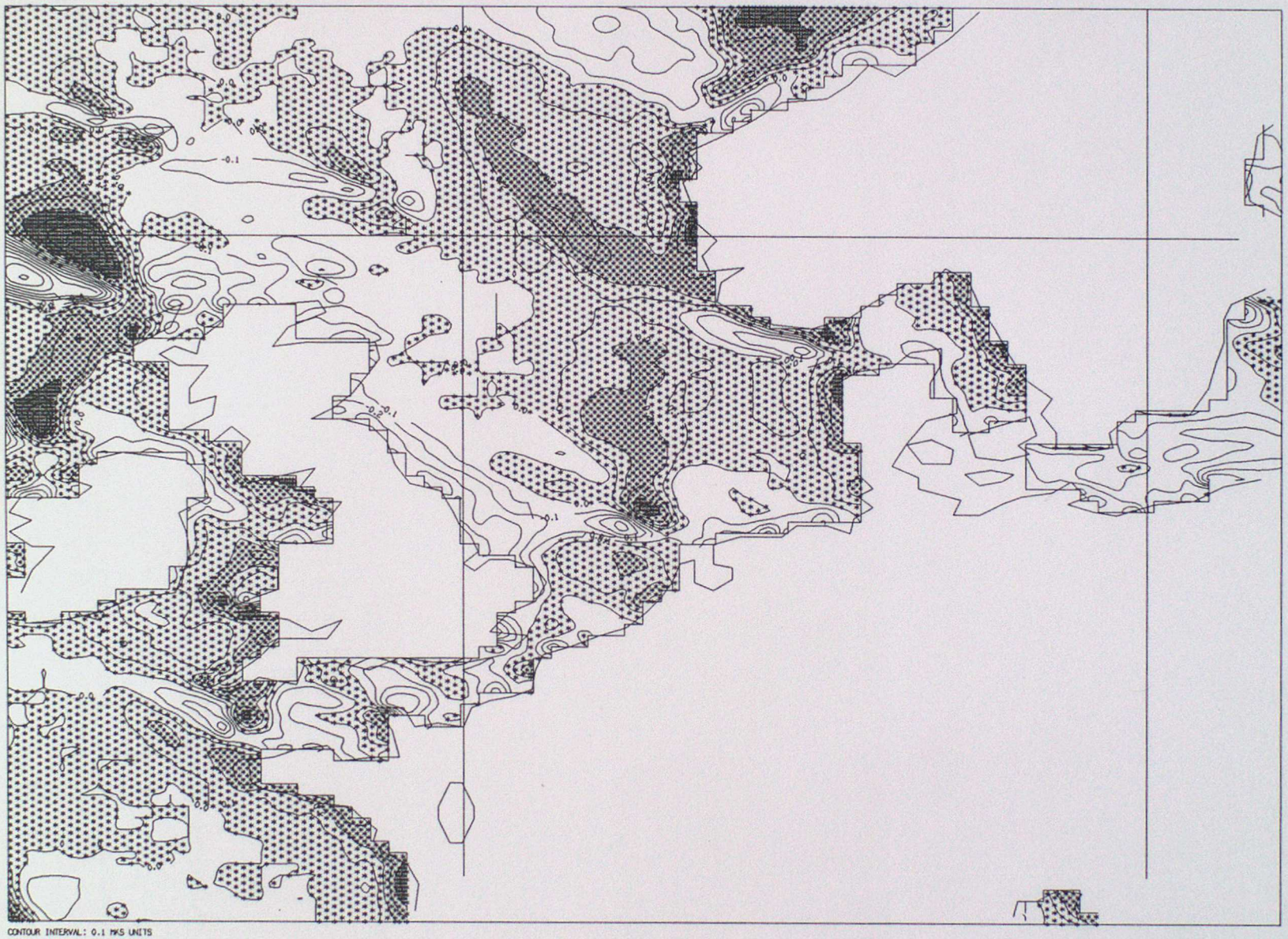
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 140 degrees minus U=15 / 130 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



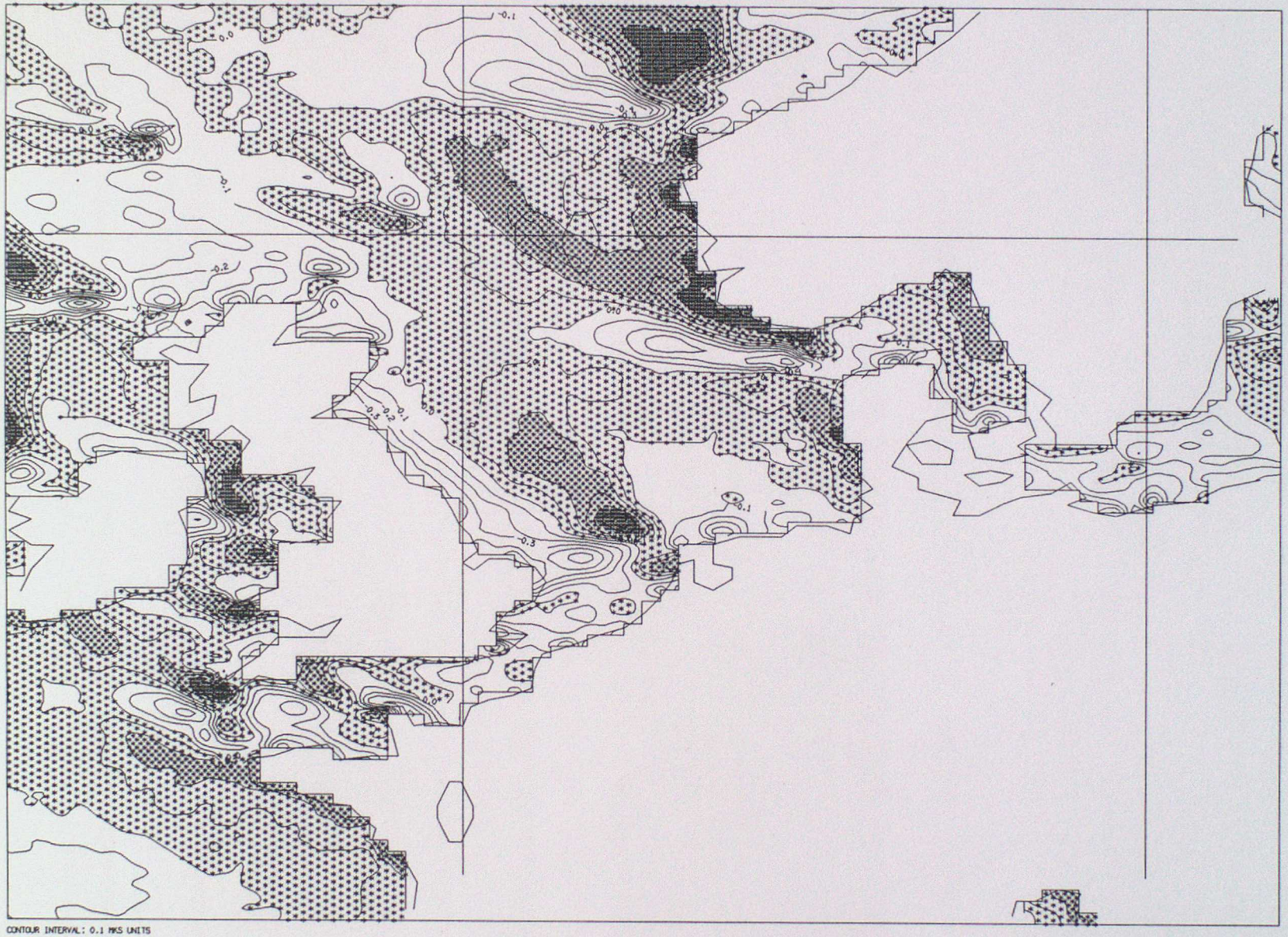
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 130 degrees minus U=15 / 120 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



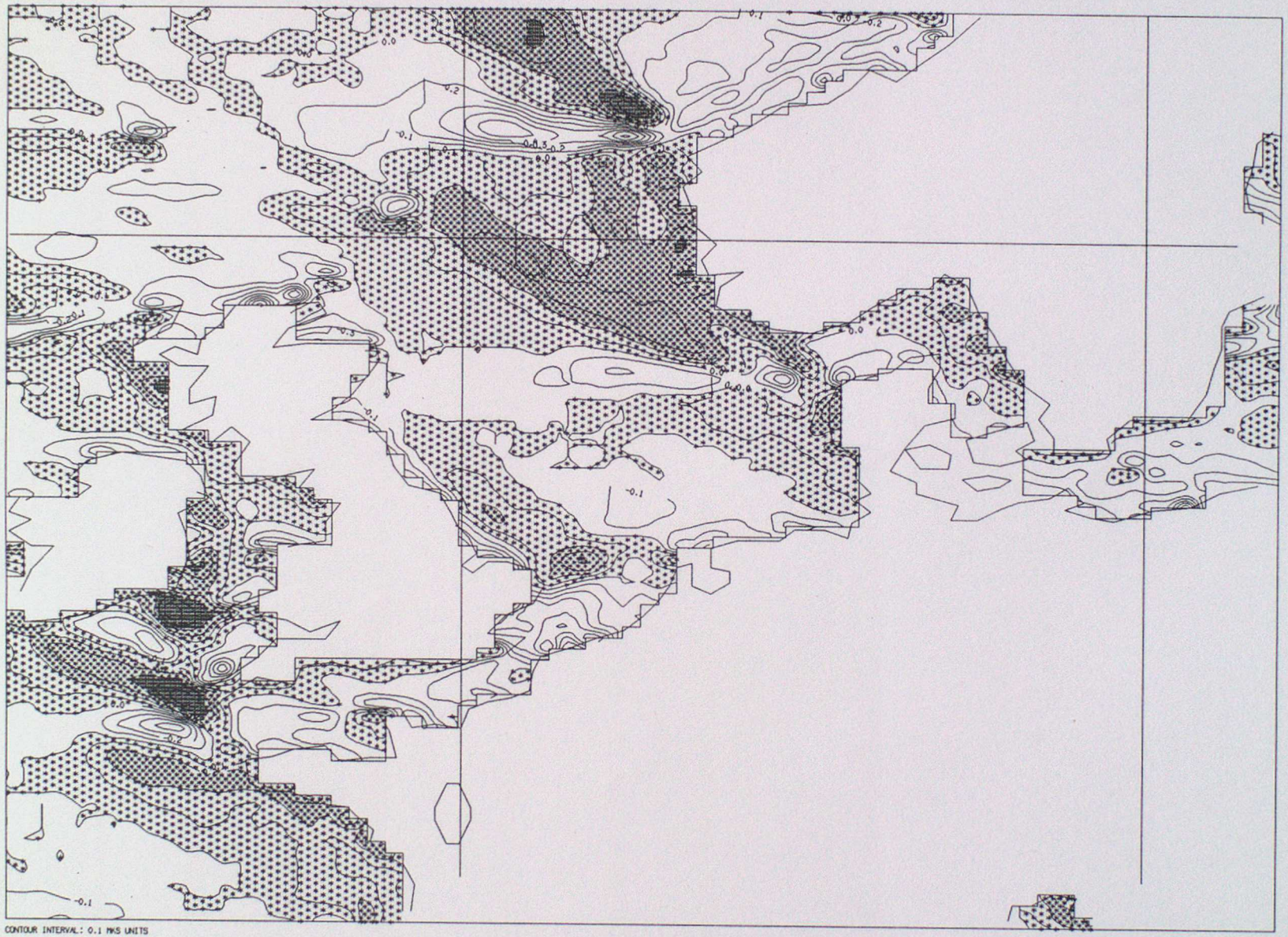
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 120 degrees minus U=15 / 110 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



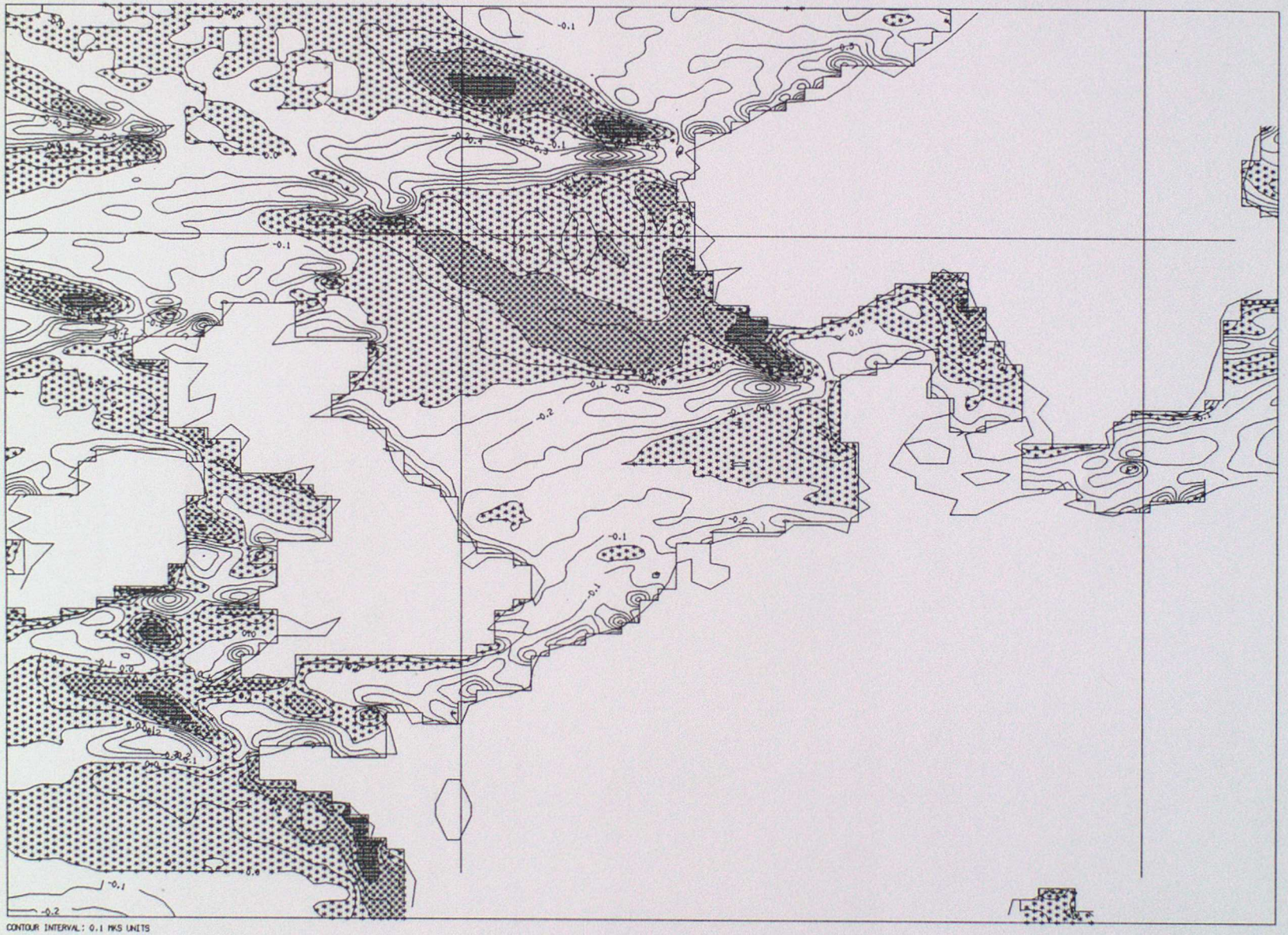
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 110 degrees minus U=15 / 100 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



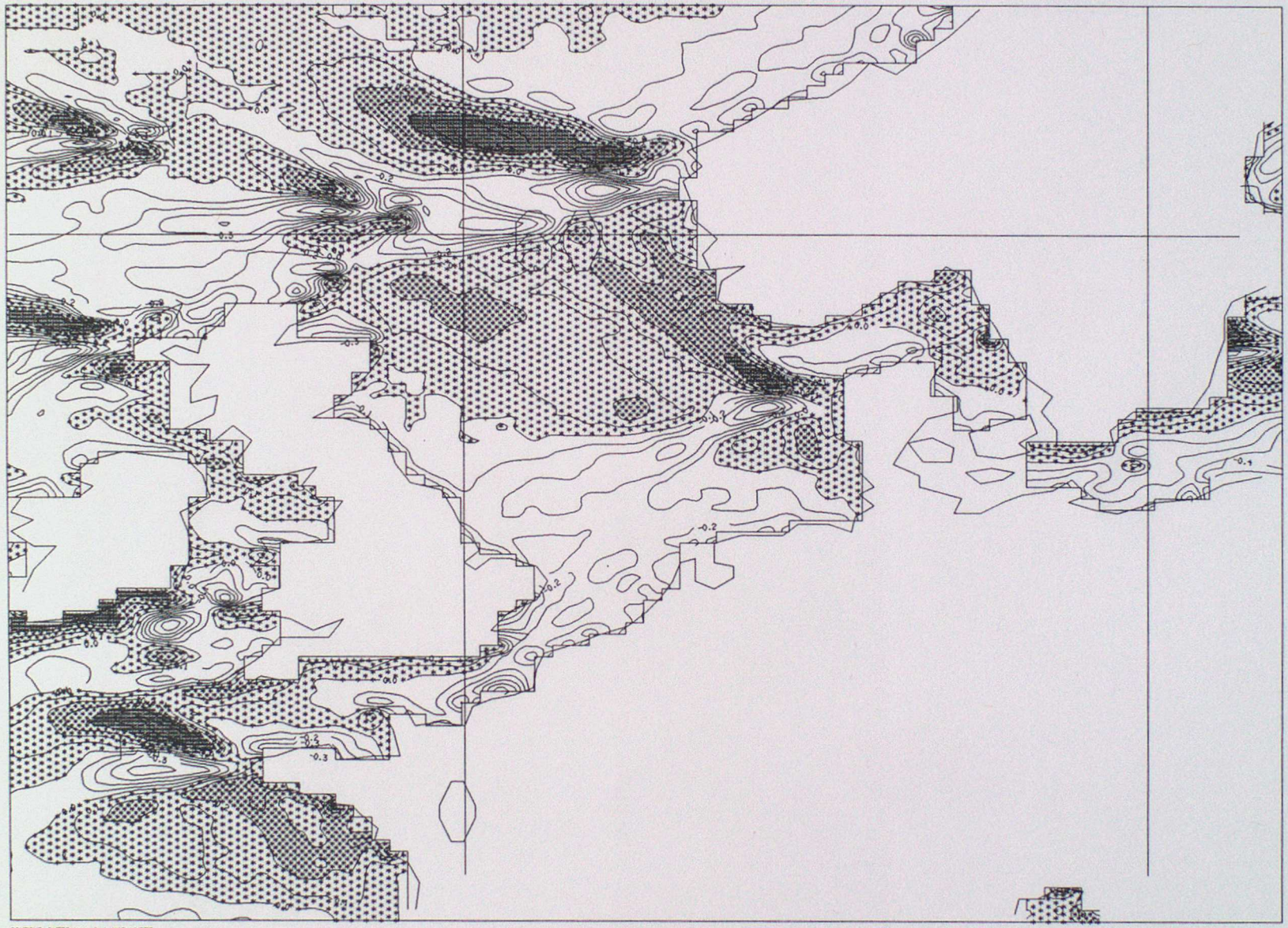
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 100 degrees minus U=15 / 090 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



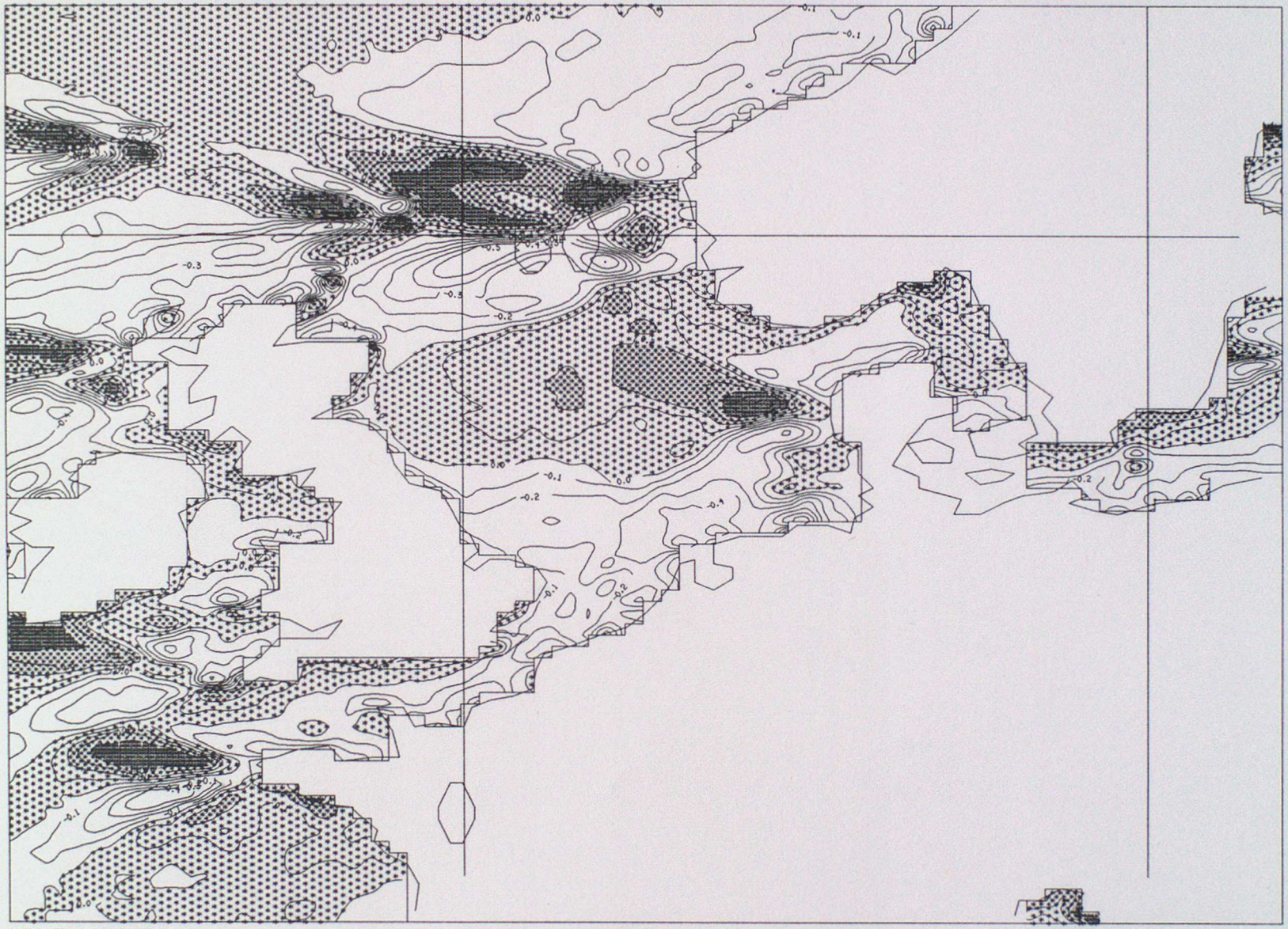
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 090 degrees minus U=15 / 080 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



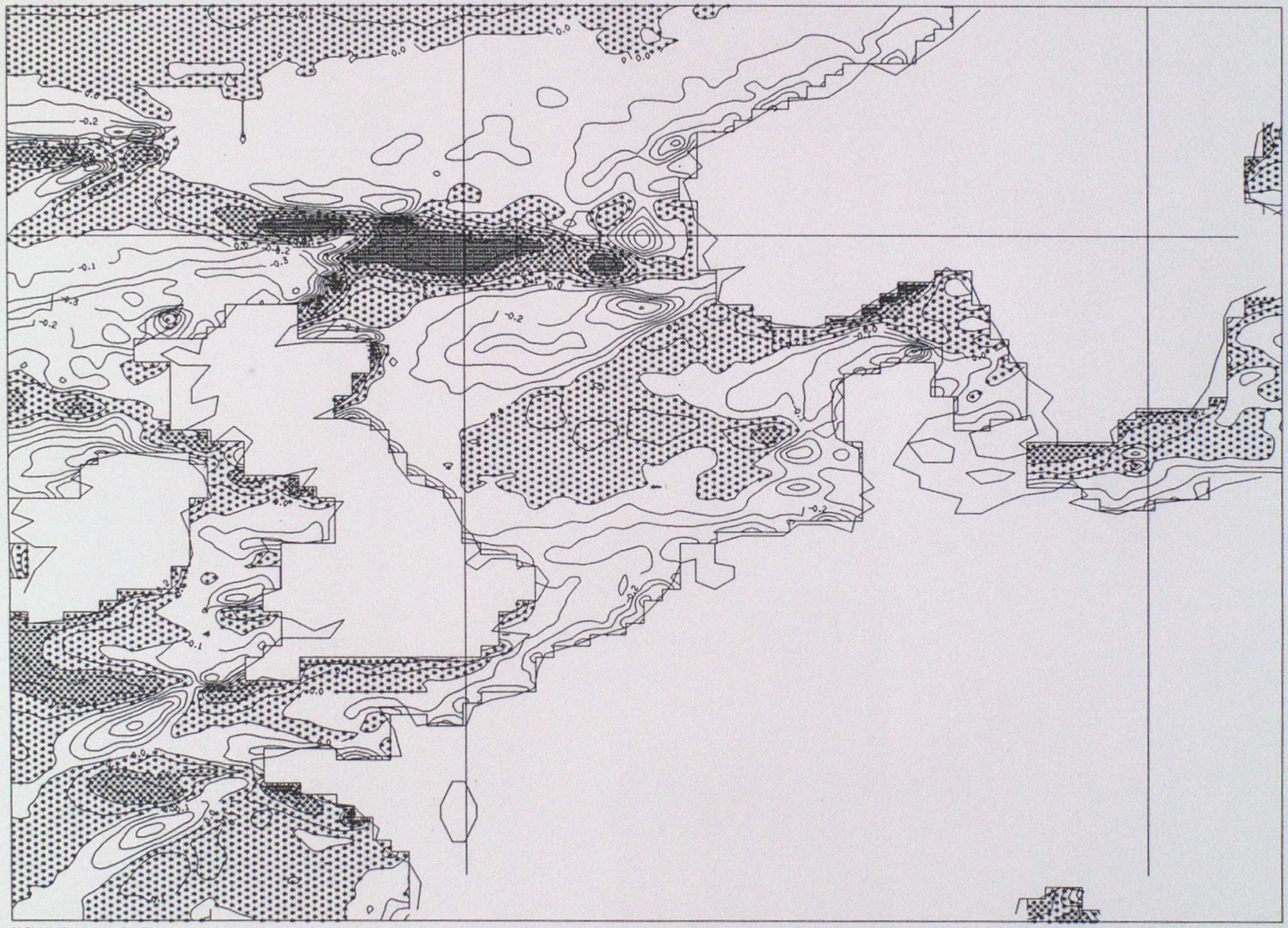
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 080 degrees minus U=15 / 070 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



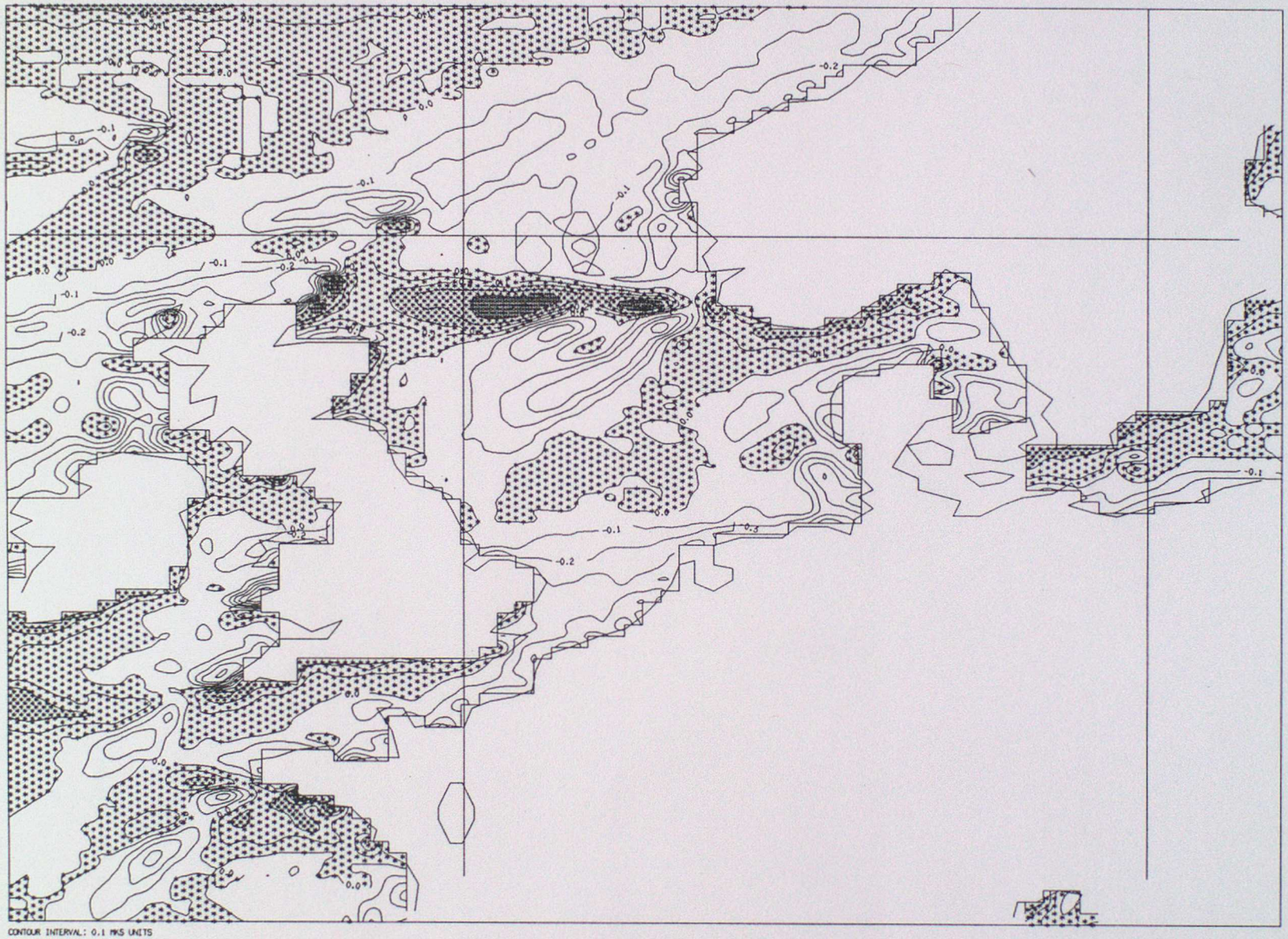
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 070 degrees minus U=15 / 060 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



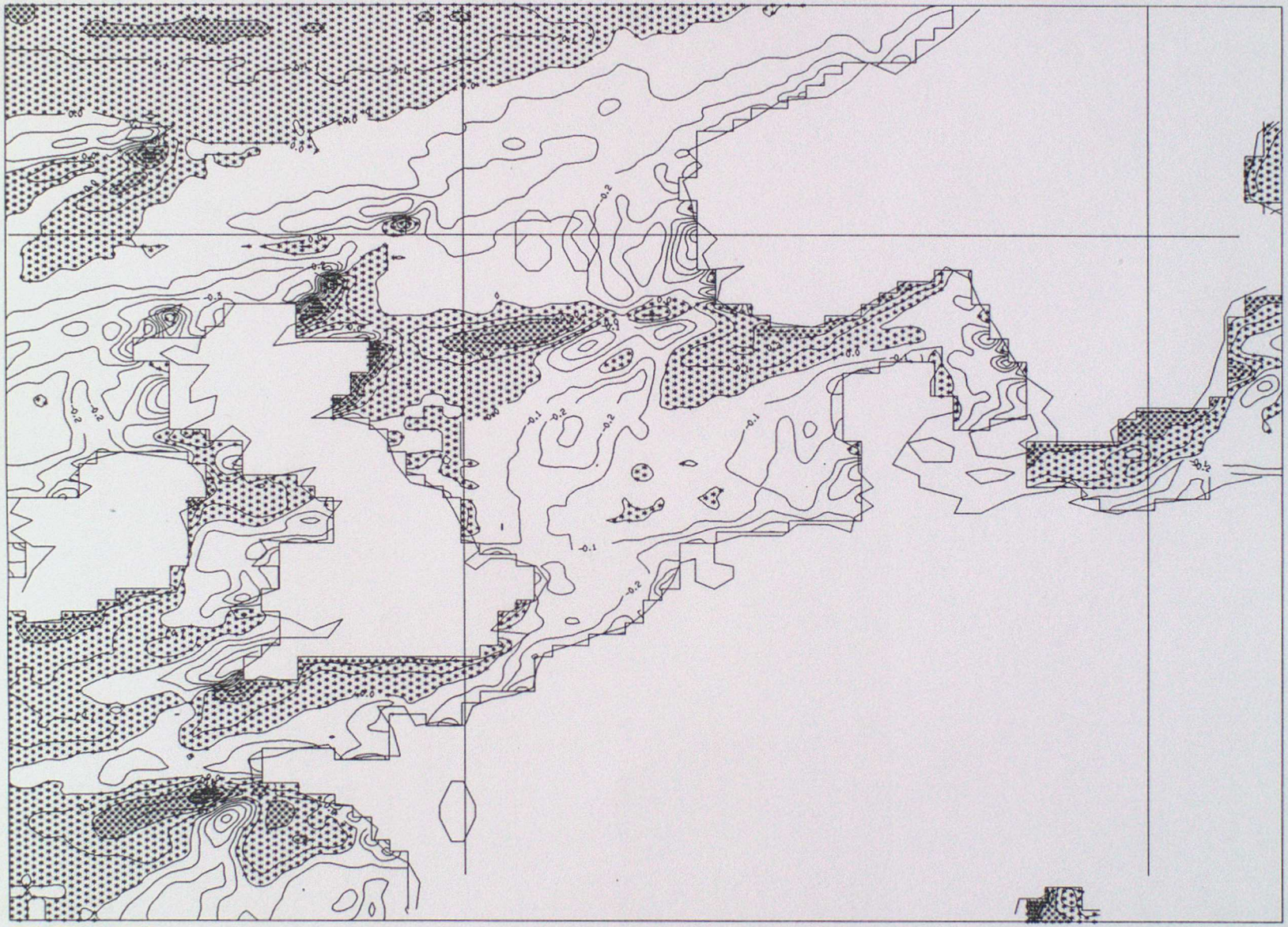
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 060 degrees minus U=15 / 050 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



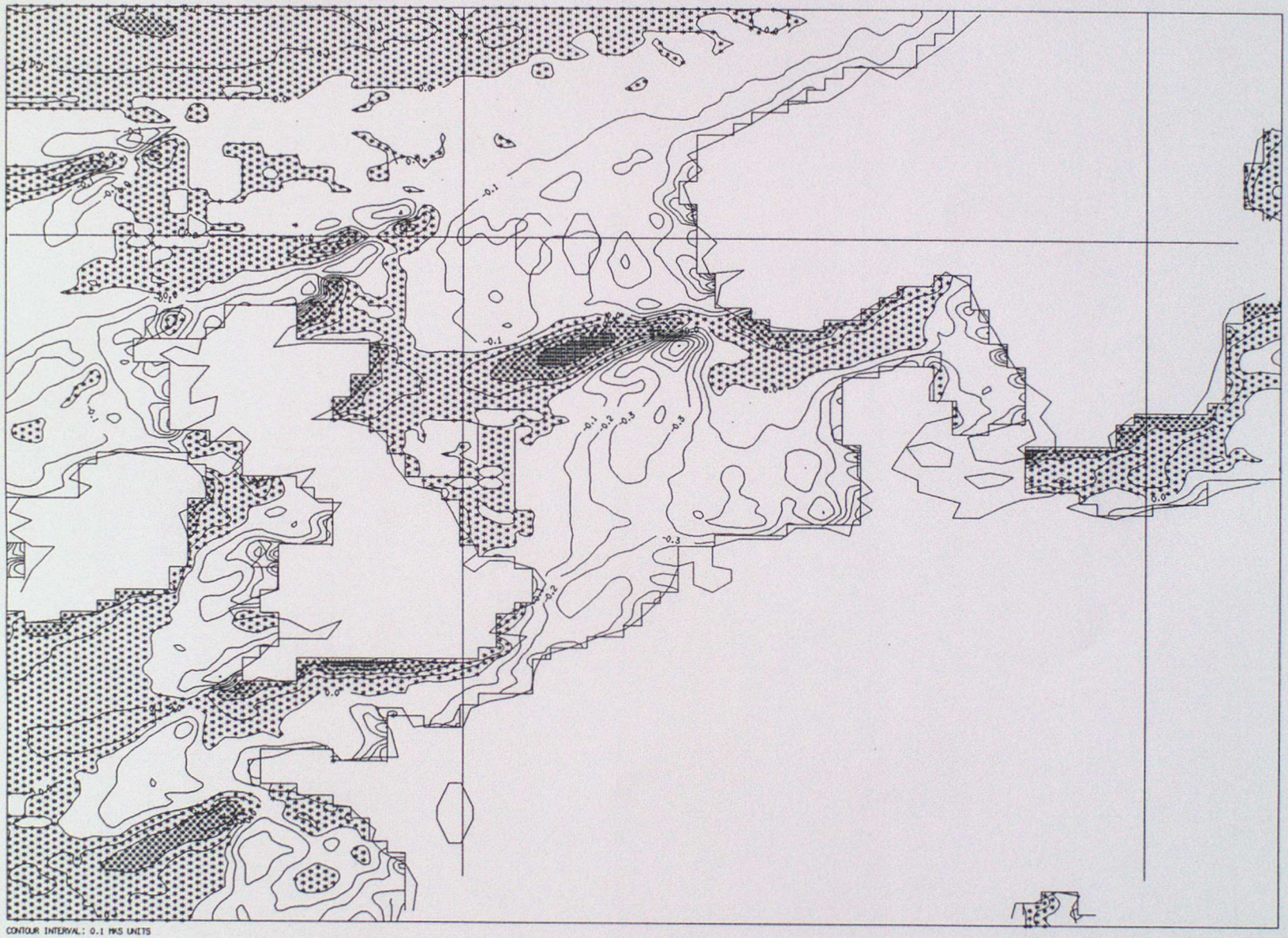
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 050 degrees minus U=15 / 040 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



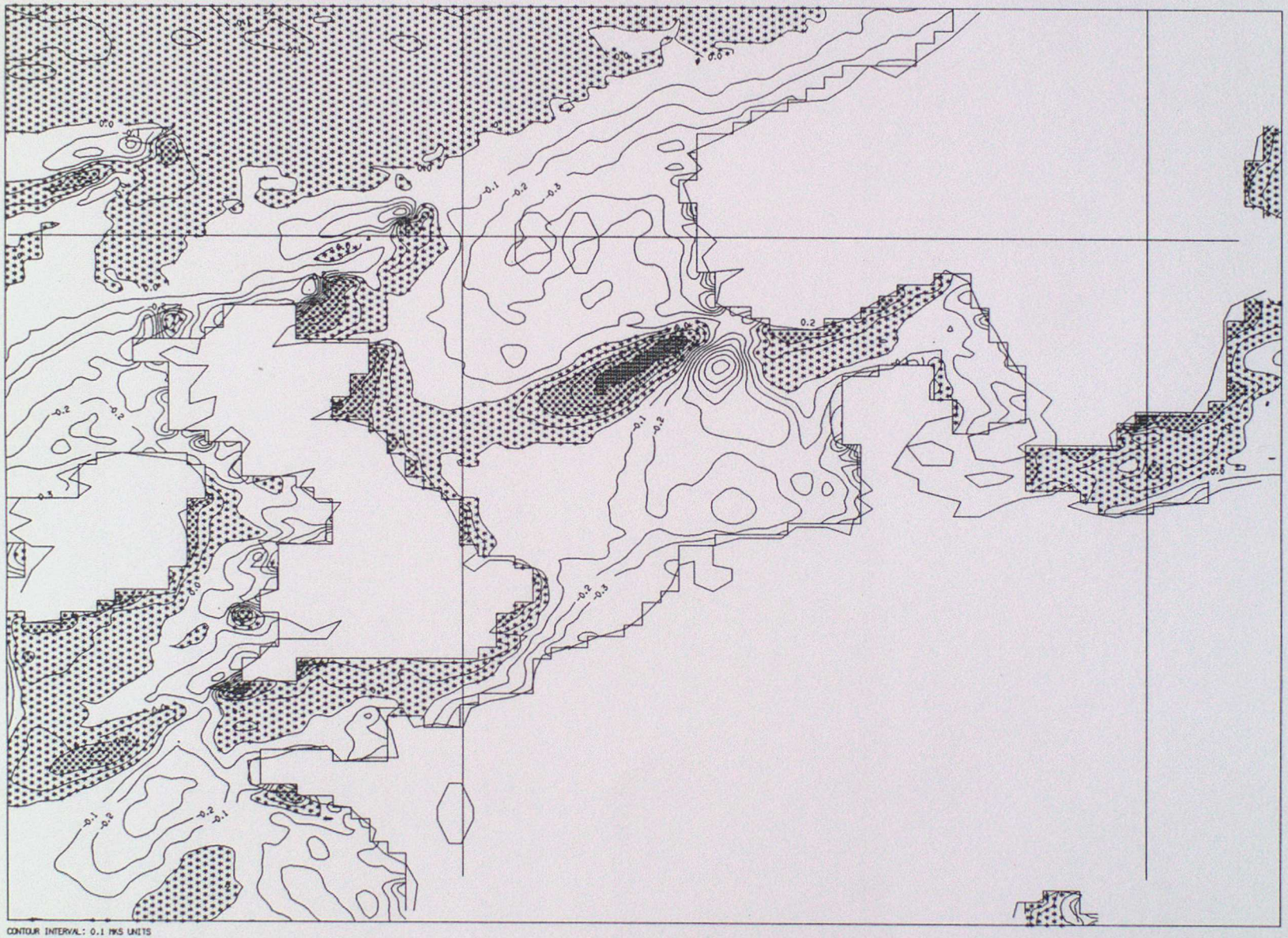
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 040 degrees minus U=15 / 030 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



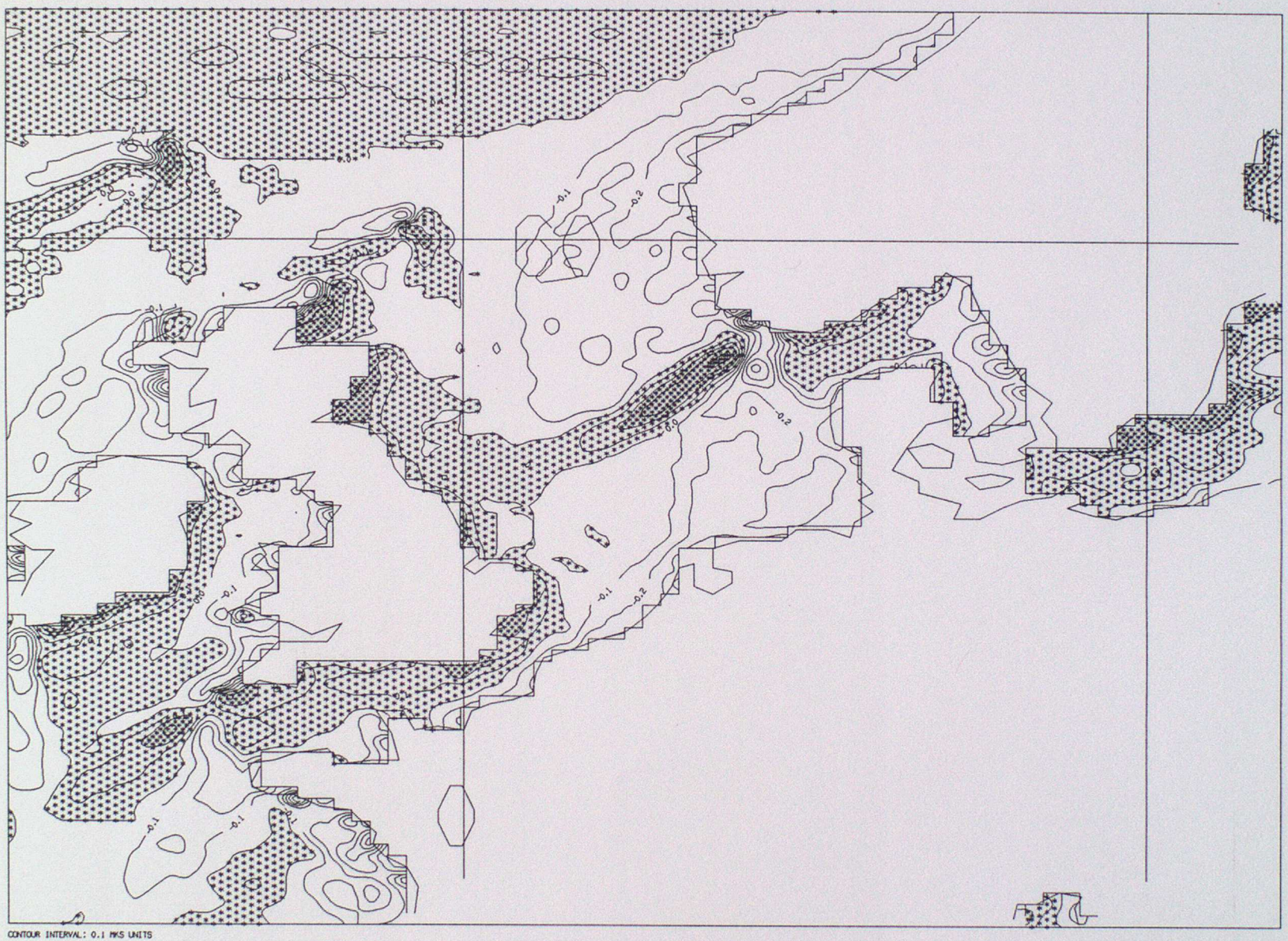
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 030 degrees minus U=15 / 020 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



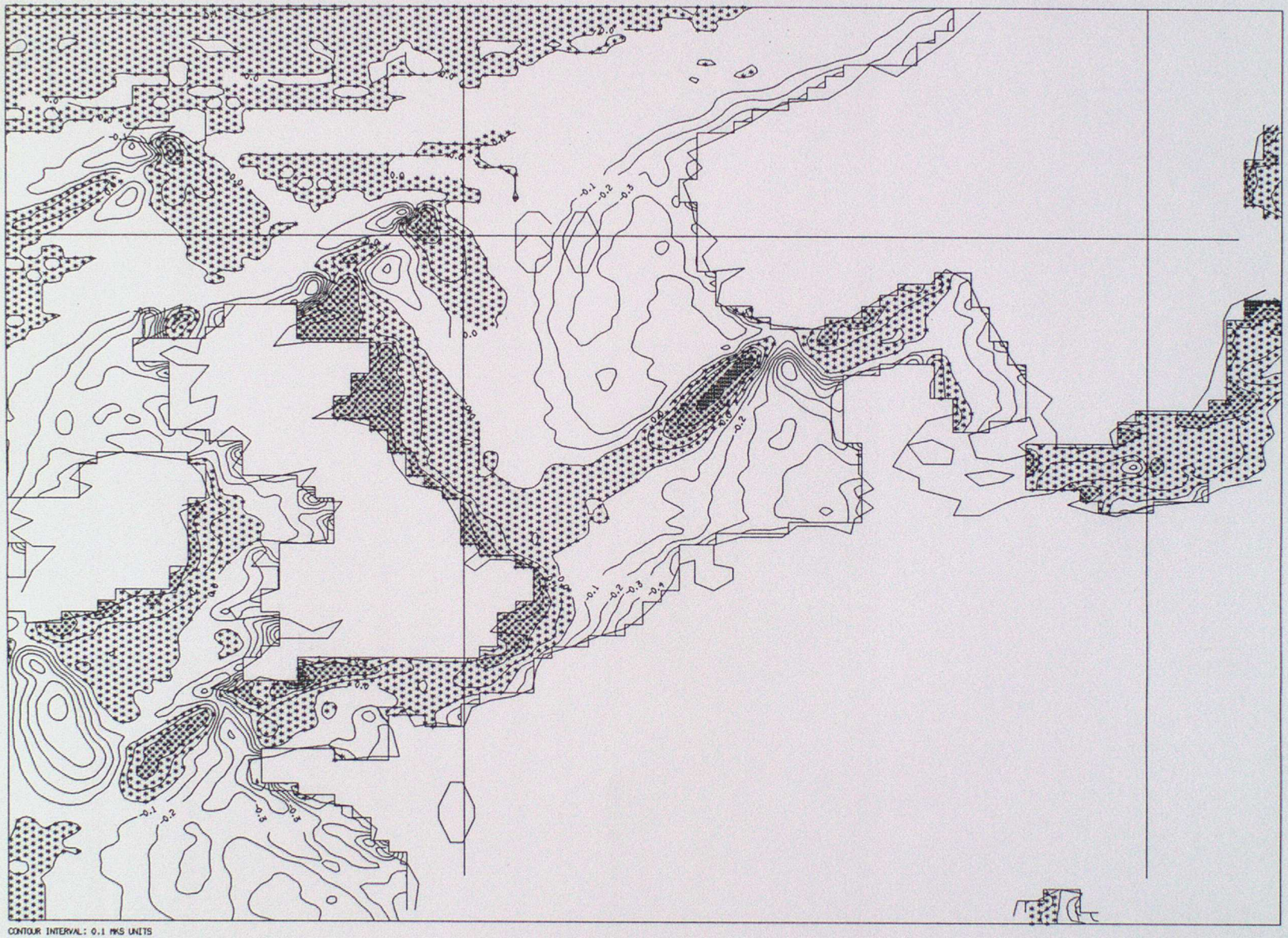
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 020 degrees minus U=15 / 010 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



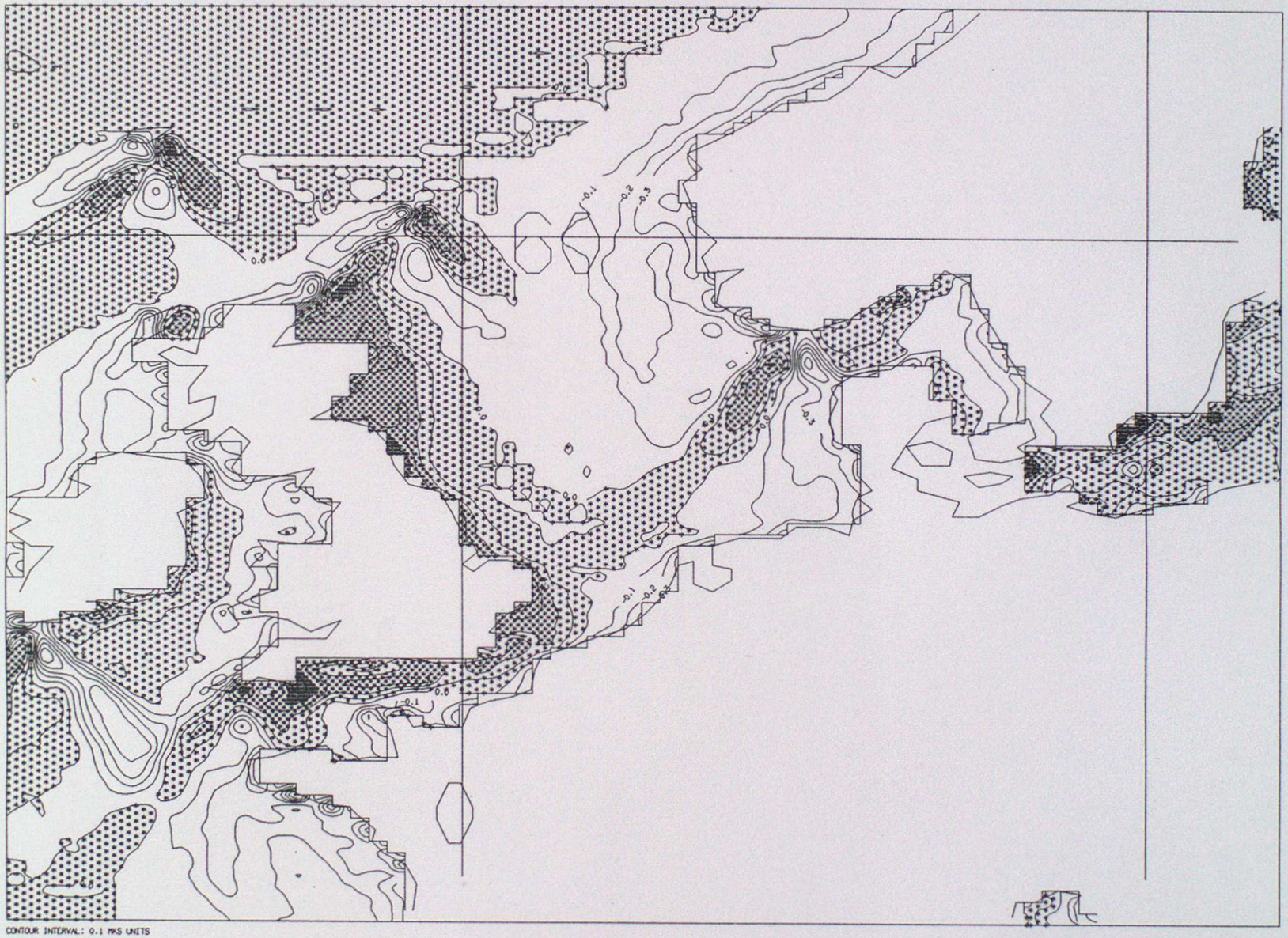
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 010 degrees minus U=15 / 000 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



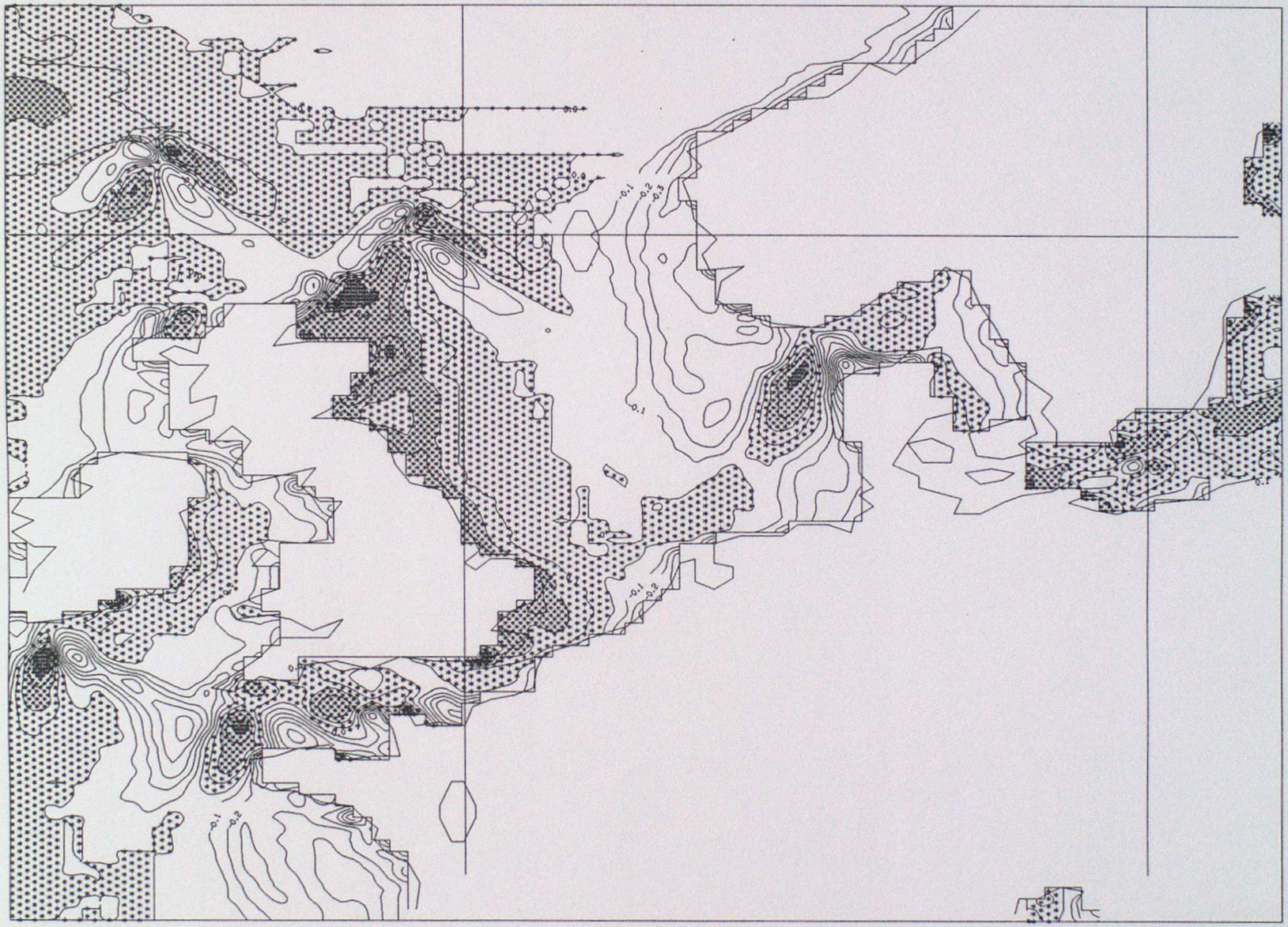
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 000 degrees minus U=15 / 350 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



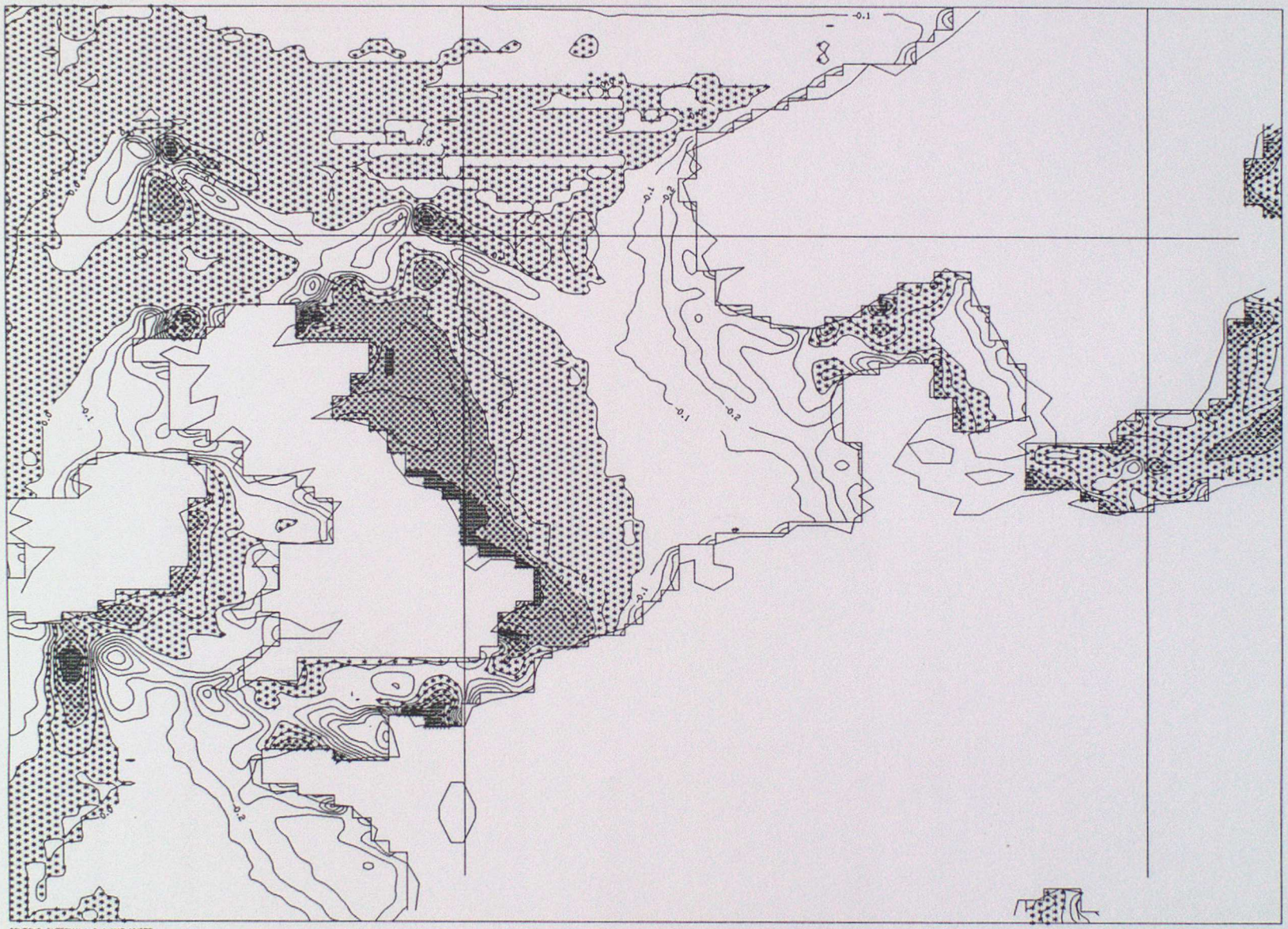
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 350 degrees minus U=15 / 340 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



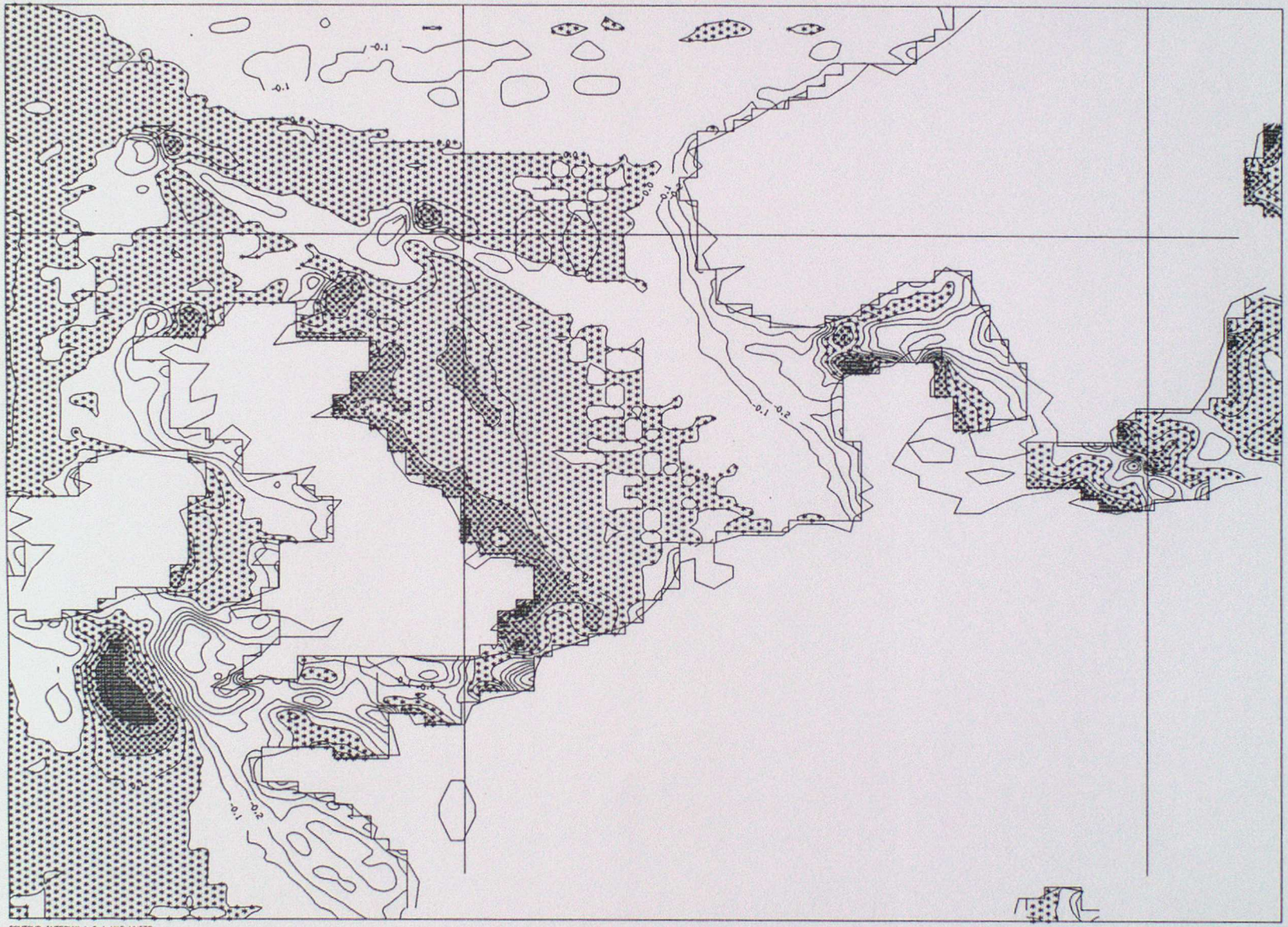
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 340 degrees minus U=15 / 330 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



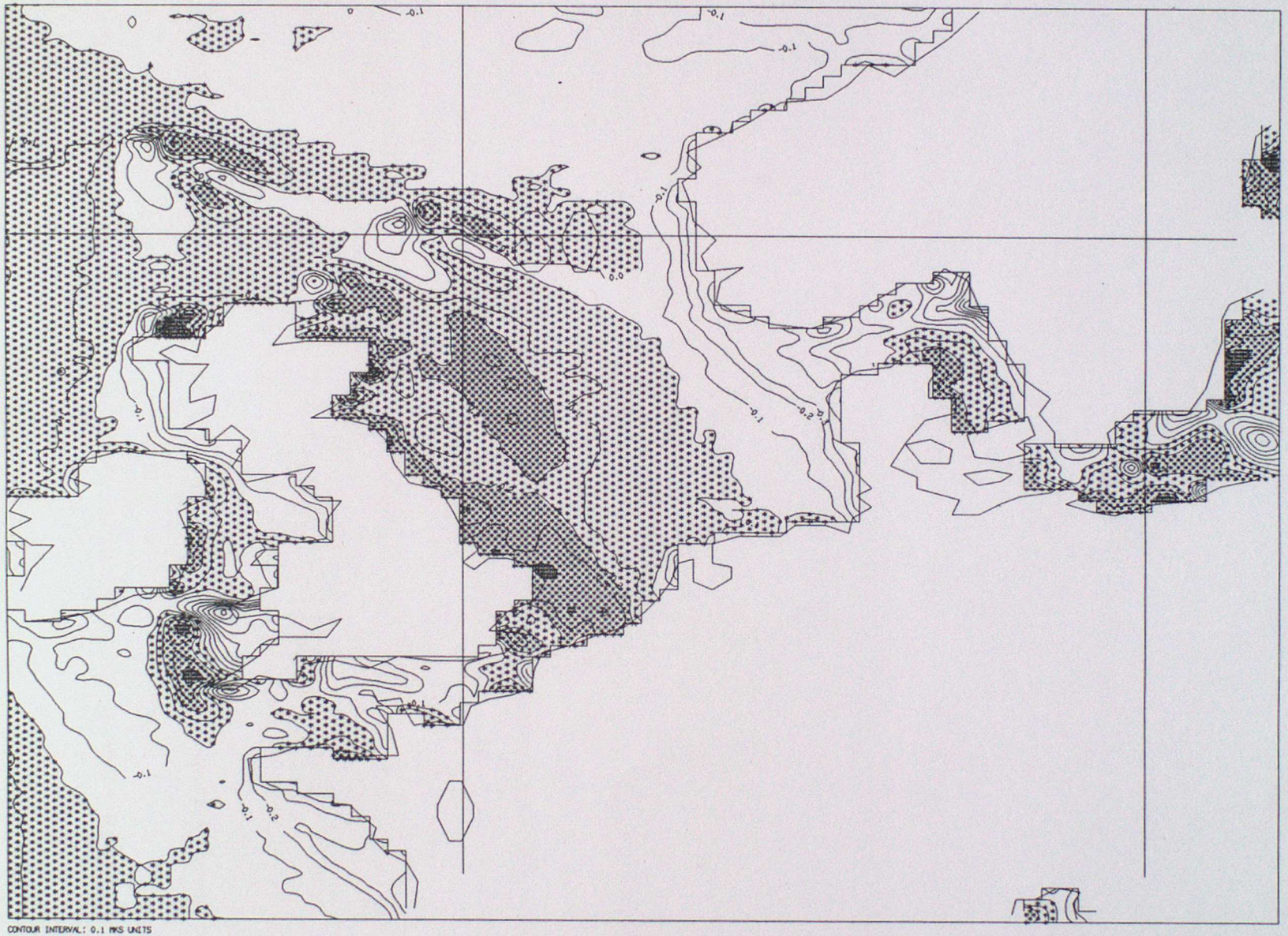
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 330 degrees minus U=15 / 320 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



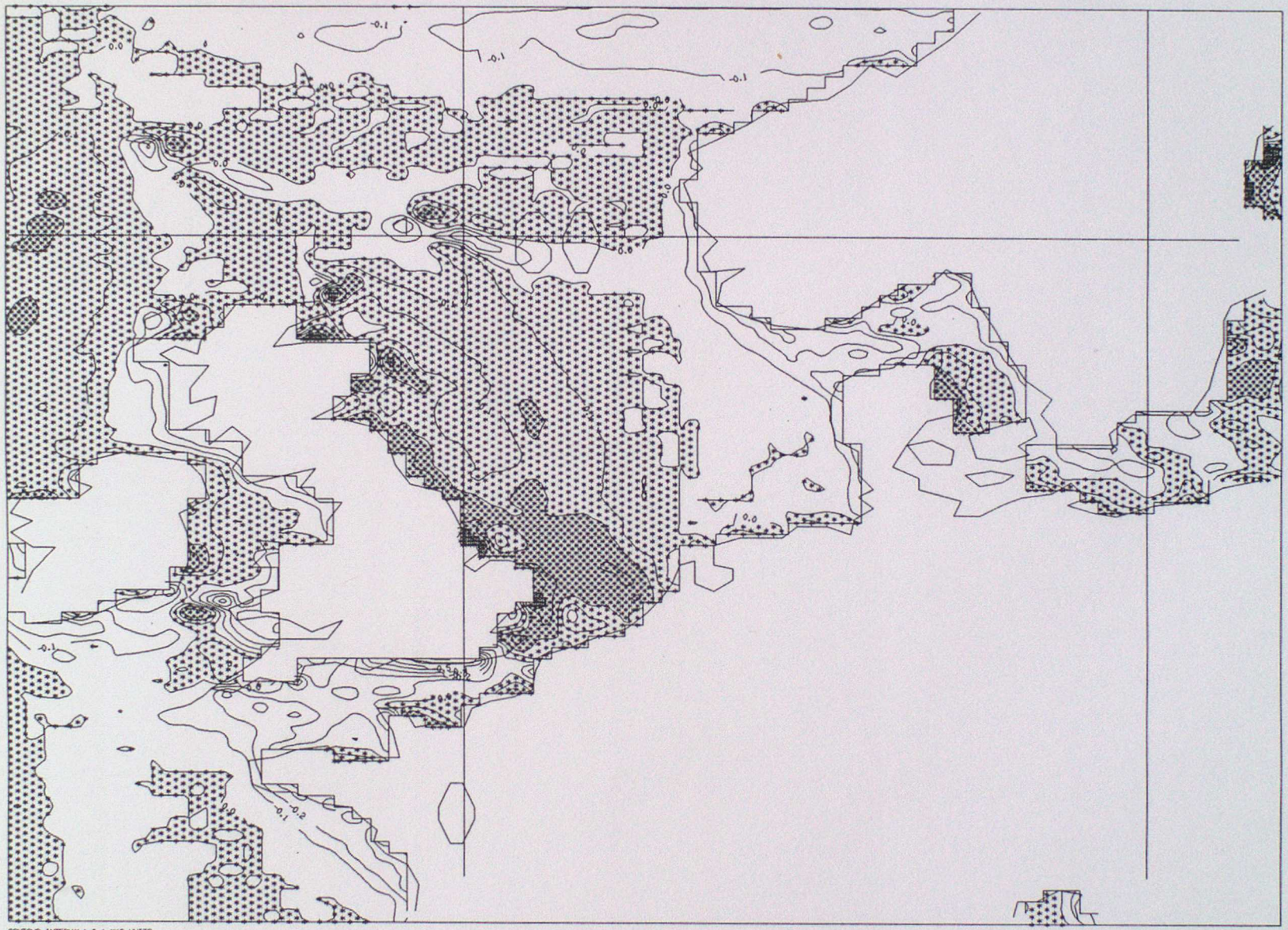
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 320 degrees minus U=15 / 310 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



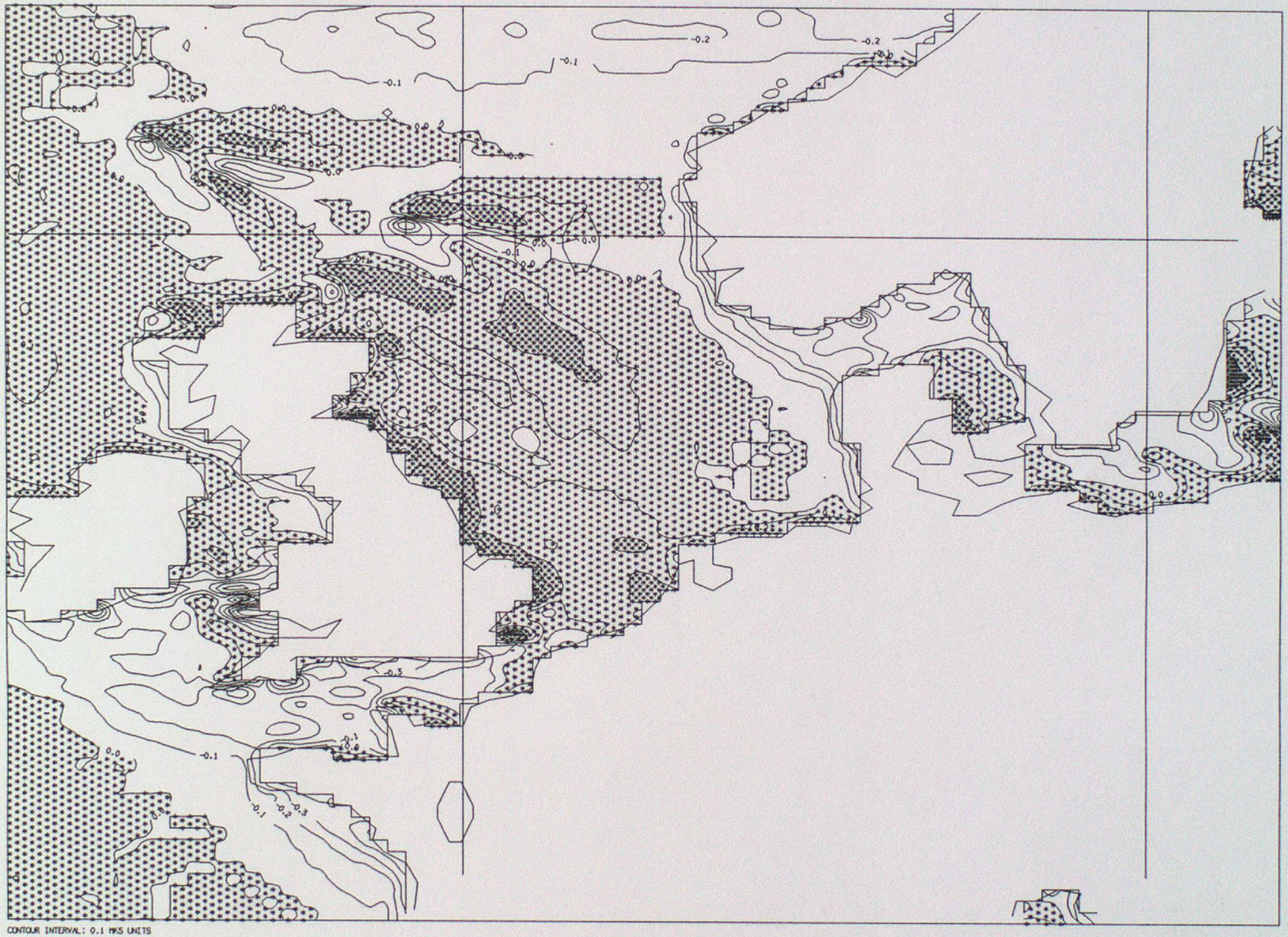
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 310 degrees minus U=15 / 300 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60

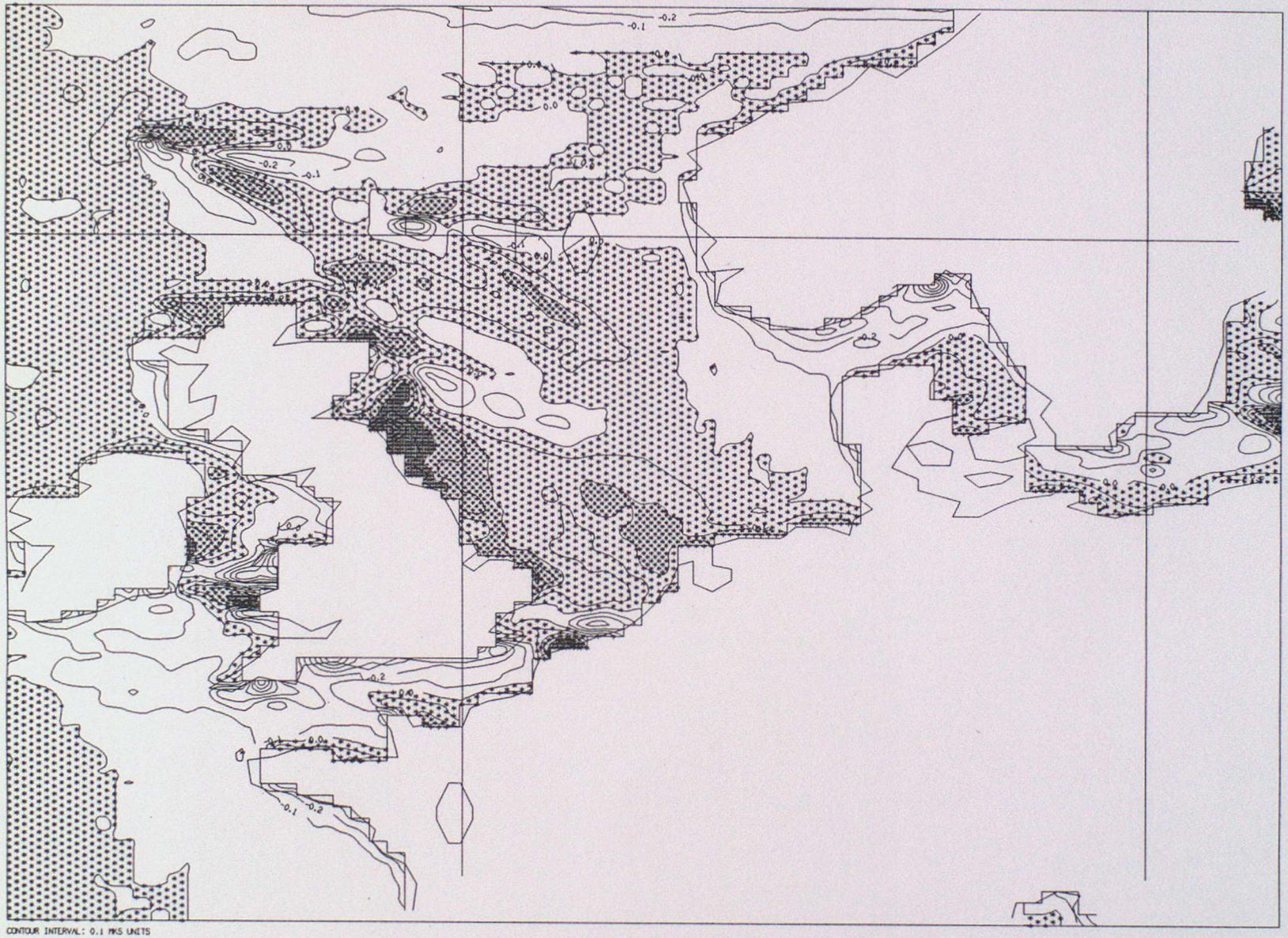

-0.2
-0.2
-0.1
-0.1
0.0
0.0
0.0
0.0
0.0
-0.1
0.0
0.0
0.0
0.0
0.0

WAVE HEIGHT DIFFERENCE U=15m/s 300 degrees minus U=15 / 290 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



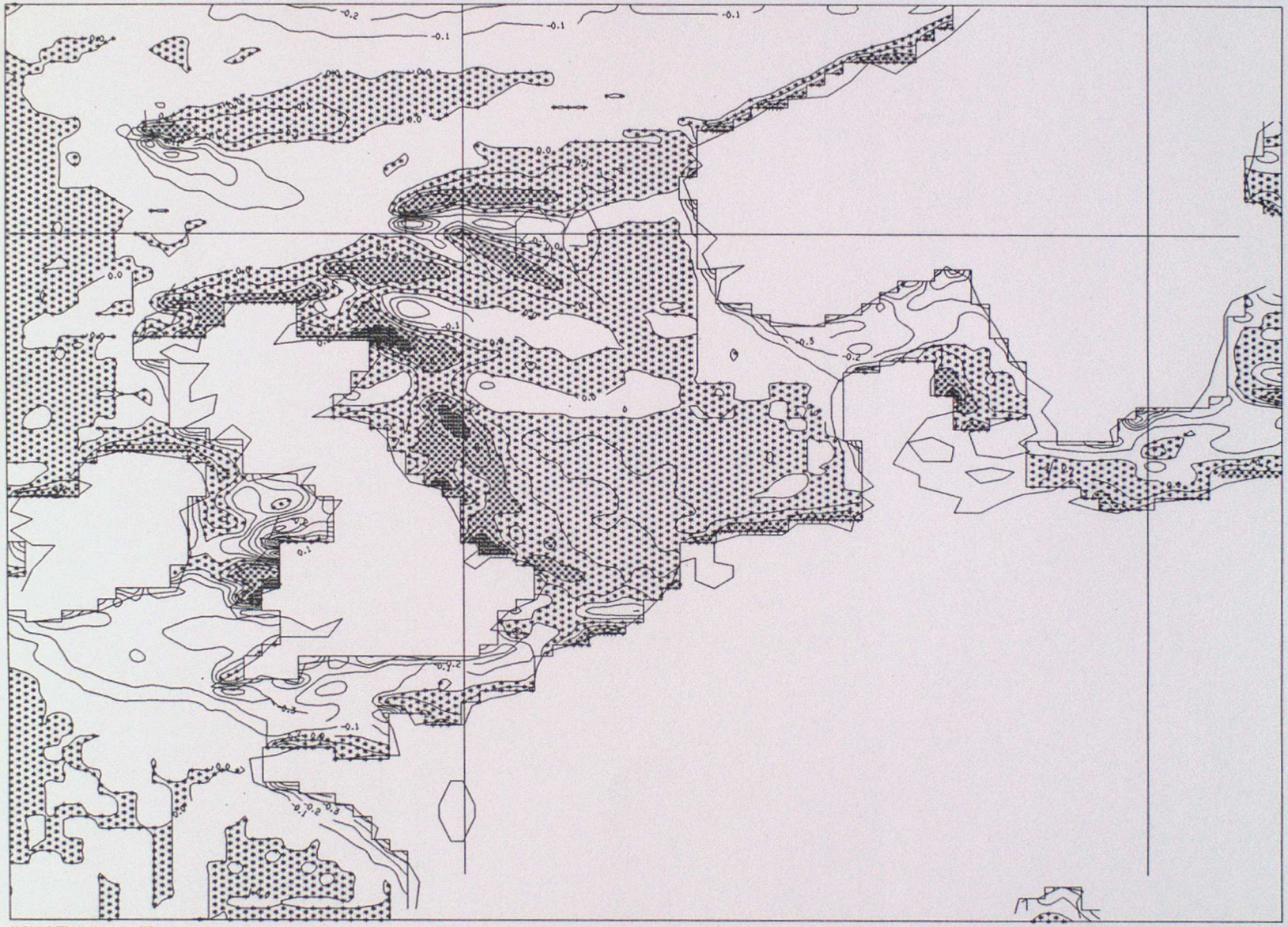
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 290 degrees minus U=15 / 280 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



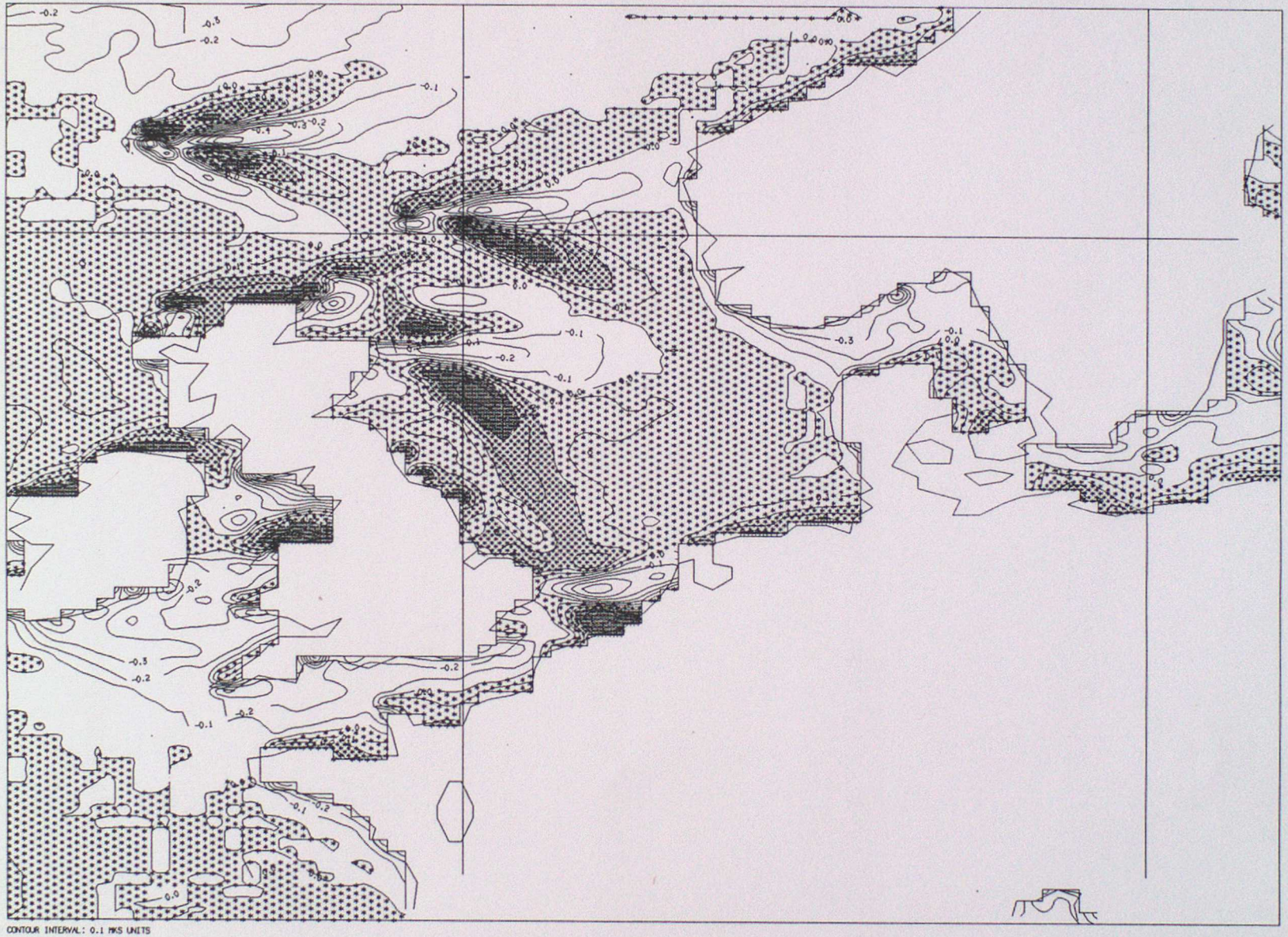
CONTOUR INTERVAL: 0.1 MKS UNITS

WAVE HEIGHT DIFFERENCE U=15m/s 280 degrees minus U=15 / 270 deg

EUROPEAN MODEL - DEEP WATER

VALID AT 12Z ON 3/1/1993 DATA TIME 0Z ON 1/1/1993

SURFACE EXPERIMENT NO.: 8 T+60



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